

S/N 10/578,138

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NEWS 1 Web Page for STN Seminar Schedule - N. America  
NEWS 2 AUG 15 CAOLD to be discontinued on December 31, 2008  
NEWS 3 OCT 07 EPFULL enhanced with full implementation of EPC2000  
NEWS 4 OCT 07 Multiple databases enhanced for more flexible patent number searching  
NEWS 5 OCT 22 Current-awareness alert (SDI) setup and editing enhanced  
NEWS 6 OCT 22 WPIDS, WPINDEX, and WPIX enhanced with Canadian PCT Applications  
NEWS 7 OCT 24 CHEMLIST enhanced with intermediate list of pre-registered REACH substances  
NEWS 8 NOV 21 CAS patent coverage to include exemplified prophetic substances identified in English-, French-, German-, and Japanese-language basic patents from 2004-present  
NEWS 9 NOV 26 MARPAT enhanced with FSORT command  
NEWS 10 NOV 26 MEDLINE year-end processing temporarily halts availability of new fully-indexed citations  
NEWS 11 NOV 26 CHEMSAFE now available on STN Easy  
NEWS 12 NOV 26 Two new SET commands increase convenience of STN searching  
NEWS 13 DEC 01 ChemPort single article sales feature unavailable  
NEWS 14 DEC 12 GBFULL now offers single source for full-text coverage of complete UK patent families

NEWS EXPRESS JUNE 27 08 CURRENT WINDOWS VERSION IS V8.3,  
AND CURRENT DISCOVER FILE IS DATED 23 JUNE 2008.

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\* \* \* \* \* \* \* \* \* STN Columbus \* \* \* \* \* \* \* \* \*

FILE 'HOME' ENTERED AT 16:09:55 ON 12 DEC 2008

S/N 10/578,138

=> set abbr on perm  
SET COMMAND COMPLETED

=> set plurals on perm  
SET COMMAND COMPLETED

=> file inpadoc caplus  
COST IN U.S. DOLLARS  
FULL ESTIMATED COST

	SINCE FILE ENTRY	TOTAL SESSION
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=> s wo 1999/014635/pn  
L1 1 WO 1999/014635/PN

=> d 11 1 all

L1 ANSWER 1 OF 1 INPADOCDB COPYRIGHT 2008 EPO/FIZ KA on STN  
  
AN 14761138 INPADOCDB  
FN 7654376  
TI METHOD OF AND APPARATUS FOR PROCESSING AN IMAGE SIGNAL.  
TL English  
IN TILLETT, ROBIN, DEIRDRE, 6 CHURCH ROAD, FLITWICK, BEDFORDSHIRE MK45 1AE;  
MCFARLANE, NIGEL, JAMES, BRUCE, WREST PARK LODGE, SILSOE, BEDFORDSHIRE MK45  
4DP  
INS TILLETT ROBIN DEIRDRE, GB; MCFARLANE NIGEL JAMES BRUCE, GB  
PA NATIONAL RESEARCH DEVELOPMENT CORPORATION, 101 NEWINGTON CAUSEWAY, LONDON  
SE1 6BU  
PAS NAT RES DEV, GB  
DT Patent  
PI WO 9014635 A1 19901129  
PIT WOA1 INTERNATIONAL PUBLICATION WITH INTERNATIONAL SEARCH REPORT  
FDT WO100000 With international search report;  
WO030000 Before expiration of time limit for amending the claims and to  
be republished in the event of the receipt of the amendments  
DAV 19901129 examined-printed-without-grant  
STA PRE-GRANT PUBLICATION  
DS W: AU CA JP US  
RW (EPO): AT BE CH DE DK ES FR GB IT LU NL SE  
AI WO 1990-GB813 W 19900524 English  
AIT WOW International application Number  
PRAI GB 1989-12226 A 19890526 (GBA)  
PRAIT GBA Patent application  
REC 4. THERE ARE 4 CITED REFERENCES (0 PATENT, 4 NON PATENT) AVAILABLE FOR  
THIS RECORD. ALL CITATIONS ARE AVAILABLE IN THE RE FORMAT.  
ICM G06F015-68  
ICI G06F015-68 ( )  
IPCR G06T0007-00 [I,A]; G06T0005-00 [I,A]; G06T0007-40 [I,A]  
G06T0007-00 [I,C\*]; G06T0005-00 [I,C\*]; G06T0007-40 [I,C\*]  
EPC G06T0005-00F; G06T0007-40  
FA AI; AN; DAV; DS; DT; EPC; ICM; IN; INS; IPC; IPCR; LAF; PA; PAS; PI; PIT;  
PRAI; REN; TI

S/N 10/578,138

=> s ep 1021750/pn

L2 2 EP 1021750/PN

=> d 12 1-2 all

L2 ANSWER 1 OF 2 INPADOCDB COPYRIGHT 2008 EPO/FIZ KA on STN

AN 23713020 INPADOCDB

FN 3787742

TI FOTORESIST-ZUSAMMENSETZUNGEN DIE POLYZYKLISCHE POLYMERE MIT SAeURELABILEN GRUPPEN ENTHALTEN.

PHOTORESIST COMPOSITIONS COMPRISING POLYCYCLIC POLYMERS WITH ACID LABILE PENDANT GROUPS.

COMPOSITIONS DE VERNIS PHOTOSENSIBLES RENFERMANT DES POLYMERES POLYCYCLIQUES AVEC DES GROUPES ACIDES LATERAUX LIBRES.

TL German; English; French

IN GOODALL, BRIAN, L.; JAYARAMAN, SAIKUMAR; SHICK, ROBERT, A.; RHODES, LARRY, F.; ALLEN, ROBERT, DAVID; DI PIETRO, RICHARD, ANTHONY; WALLOW, THOMAS

INS GOODALL BRIAN L, US; JAYARAMAN SAIKUMAR, US; SHICK ROBERT A, US; RHODES LARRY F, US; ALLEN ROBERT DAVID, US; DI PIETRO RICHARD ANTHONY, US; WALLOW THOMAS, US

PA THE B.F. GOODRICH COMPANY

PAS GOODRICH CO B F, US

DT Patent

PI EP 1021750 A1 20000726 English

PIT EPA1 APPLICATION PUBLISHED WITH SEARCH REPORT

DAV 20000726 examined-printed-without-grant

STA PRE-GRANT PUBLICATION

DS R: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

AI EP 1998-944729 A 19980903

AIT EPA Patent application

PRAI WO 1998-US18353 W 19980903 (WOWW)

US 1997-928900 A 19970912 (USA)

PRAIT WOWW Additional PCT application

USA Patent application

REC 1. THERE IS 1 CITED REFERENCE (0 PATENT, 1 NON PATENT) AVAILABLE FOR THIS RECORD. ALL CITATIONS ARE AVAILABLE IN THE RE FORMAT.

IC.V 7

ICM G03F007-039

IPCR C08F0002-46 [I,A]; C08F0032-00 [I,A]; C08G0061-08 [I,A];

G03F0007-004 [N,A]; G03F0007-039 [I,A]

C08F0002-46 [I,C\*]; C08F0032-00 [I,C\*]; C08G0061-00 [I,C\*];

G03F0007-004 [N,C\*]; G03F0007-039 [I,C\*]

EPC G03F0007-039

ICO S03F0007:004D

FA AI; AN; DAV; DS; DT; EPC; ICM; ICO; IN; INS; IPC; IPCR; LA; PA; PAS; PI; PIT; PRAI; REN; TI

L2 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2008 ACS on STN

AN 1999:220147 CAPLUS

DN 130:244458

ED Entered STN: 08 Apr 1999

TI Photoresist composition comprising polycyclic polymer with acid-labile pendant groups

IN Goodall, Brian L.; Jayaraman, Saikumar; Shick, Robert A.; Rhodes, Larry F.; Allen, Robert David; Di Pietro, Richard Anthony; Wallow, Thomas

PA The B.F. Goodrich Company, USA

SO PCT Int. Appl., 121 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA English  
 IC ICM G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9914635	A1	19990325	WO 1998-US18353	19980903
	W: AL, AM, AU, AZ, BA, BB, BG, BR, BY, CA, CN, CZ, EE, GE, HU, ID, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW				
	RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	AU 9892199	A	19990405	AU 1998-92199	19980903
	AU 747516	B2	20020516		
	EP 1021750	A1	20000726	EP 1998-944729	19980903 <--
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2001516804	T	20011002	JP 2000-512109	19980903
	RU 2199773	C2	20030227	RU 2000-109327	19980903
	CN 1251021	C	20060412	CN 1998-808966	19980903
	TW 235285	B	20050701	TW 1998-87115292	19981023
	HK 1030992	A1	20061110	HK 2001-101755	20010312
PRAI	US 1997-928900	A	19970912		
	WO 1998-US18353	W	19980903		

## CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	WO 9914635	ICM	G03F007-039
		IPCI	G03F0007-039 [ICM,6]
		IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
		ECLA	G03F007/039; S03F
	AU 9892199	IPCI	G03F0007-039 [ICM,6]
		IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
	EP 1021750	IPCI	G03F0007-039 [ICM,6]
		IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
		ECLA	G03F007/039; S03F
	JP 2001516804	IPCI	C08F0032-00 [ICM,7]; C08F0002-46 [ICS,7]; C08G0061-08 [ICS,7]; C08G0061-00 [ICS,7,C*]; G03F0007-039 [ICS,7]
		IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A];

		G03F0007-039 [I,C*]; G03F0007-039 [I,A]
RU 2199773	IPCI	G03F0007-004 [ICM]; G03C0001-72 [ICS]; C08G0061-08 [ICS]; C08G0061-00 [ICS,C*]
	IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
	ECLA	G03F007/039
CN 1251021	IPCI	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; G03F0007-039 [I,C]; G03F0007-039 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]
	IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; G03F0007-039 [I,C]; G03F0007-039 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]
	ECLA	G03F007/039; S03F
TW 235285	IPCI	G03F0007-004 [ICS,7]
	IPCR	G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
HK 1030992	IPCR	G03F [I,S]; G03F0007-004 [I,C*]; G03F0007-004 [I,A]; C08F0002-46 [I,C*]; C08F0002-46 [I,A]; C08F0032-00 [I,C*]; C08F0032-00 [I,A]; C08G0061-00 [I,C*]; C08G0061-08 [I,A]; G03C0001-72 [I,C*]; G03C0001-72 [I,A]; G03F0007-039 [I,C*]; G03F0007-039 [I,A]
	ECLA	G03F007/039
AB	The present invention relates to a photoresist composition comprising a photoacid generator and a polycyclic polymer comprising repeating units that contain acid-labile pendant groups. Upon exposure to an imaging radiation source the photoacid generator generates an acid which cleaves the acid-labile pendant groups effecting a polarity change in the polymer. The polymer is rendered soluble in an aqueous base in the areas exposed to the imaging source.	
ST	photoresist polycyclic polymer acid labile group	
IT	Photoresists (containing polycyclic polymers with acid-labile pendant groups and photoacid generators)	
IT	139301-16-9 RL: TEM (Technical or engineered material use); USES (Uses) (Sartomer 1012; photoresists containing polycyclic polymers with acid-labile pendant groups and)	
IT	221125-26-4P RL: SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses) (photoresists containing polycyclic polymers with acid-labile pendant groups and)	
IT	57900-42-2, Triphenylsulfonium hexafluoroarsenate 189201-19-2, Sartomer CD 1010 RL: TEM (Technical or engineered material use); USES (Uses) (photoresists containing polycyclic polymers with acid-labile pendant groups and)	
IT	196805-20-6P RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or engineered material use); PREP (Preparation); RACT (Reactant or reagent); USES (Uses) (preparation and reaction in preparing norbornene compound for preparing cyclic	

S/N 10/578,138

polymers for photoresists)  
IT 7184-08-9P, Diethyl bicyclo[2.2.1]hept-5-ene-exo, exo-2,3-dicarboxylate  
196805-11-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); TEM (Technical or  
engineered material use); PREP (Preparation); RACT (Reactant or reagent);  
USES (Uses)  
(preparation and reaction in preparing polycyclic polymers for photoresists)  
IT 185621-23-2P 195154-83-7P 196805-16-0P 196805-18-2P 221125-12-8P  
221125-13-9P 221125-14-0P 221125-15-1P 221125-17-3P 221125-18-4P  
221125-20-8P 221125-21-9P 221125-22-0P 221125-23-1P 221125-28-6P  
221125-29-7P  
RL: SPN (Synthetic preparation); TEM (Technical or engineered material  
use); PREP (Preparation); USES (Uses)  
(preparation and use in preparing photoresists)  
IT 542-92-7, Cyclopentadiene, reactions 53399-81-8, Ethyl  
2-methyl-4-pentenoate  
RL: RCT (Reactant); TEM (Technical or engineered material use); RACT  
(Reactant or reagent); USES (Uses)  
(reaction in preparing norbornene compound for preparing cyclic polymers for  
photoresists)  
RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
RE  
(1) Goodrich, F; WO 9733198 A 1997 CAPLUS  
(2) Goodrich Co B F; EP 0140319 A 1985 CAPLUS  
(3) Hiroharu, I; US 4106943 A 1978  
(4) Japan Synthetic Rubber Co Ltd; EP 0789278 A 1997 CAPLUS  
(5) Samsung Electronics Co Ltd; EP 0836119 A 1998 CAPLUS

=> FIL STNGUIDE  
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ENTRY SESSION  
FULL ESTIMATED COST 14.09 14.30  
  
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) SINCE FILE TOTAL  
ENTRY SESSION  
CA SUBSCRIBER PRICE -0.80 -0.80

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FILE CONTAINS CURRENT INFORMATION.  
LAST RELOADED: Dec 5, 2008 (20081205/UP).

=> file uspatall caplus japio  
COST IN U.S. DOLLARS SINCE FILE TOTAL  
ENTRY SESSION  
FULL ESTIMATED COST 0.36 14.66  
  
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS) SINCE FILE TOTAL  
ENTRY SESSION  
CA SUBSCRIBER PRICE 0.00 -0.80

FILE 'USPATFULL' ENTERED AT 16:16:33 ON 12 DEC 2008  
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FILE 'USPATOLD' ENTERED AT 16:16:33 ON 12 DEC 2008  
CA INDEXING COPYRIGHT (C) 2008 AMERICAN CHEMICAL SOCIETY (ACS)

S/N 10/578,138

FILE 'USPAT2' ENTERED AT 16:16:33 ON 12 DEC 2008  
CA INDEXING COPYRIGHT (C) 2008 AMERICAN CHEMICAL SOCIETY (ACS)

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FILE 'JAPIO' ENTERED AT 16:16:33 ON 12 DEC 2008  
COPYRIGHT (C) 2008 Japanese Patent Office (JPO)- JAPIO

=> s trimethylsilyl!!!!!!tetracyclo!!!!carboxylate  
L3 0 TRIMETHYLSILYL!!!!!!TETRACYCLO!!!!CARBOXYLATE

=> s trimethylsilyl!!!!!!tetracyclo!!!! carboxylate  
L4 0 TRIMETHYLSILYL!!!!!!TETRACYCLO!!!! CARBOXYLATE

=> s trimethylsilyl(1w)norbornen?  
L5 66 TRIMETHYLSILYL(1W) NORBORNEN?

=> s (ethylene or ethene)(4a)(copolymer# or terpolymer#)  
L6 329756 (ETHYLENE OR ETHENE)(4A)(COPOLYMER# OR TERPOLYMER#)

=> s 15 and 16  
L7 9 L5 AND L6

=> d 17 1-9 ibib abs

L7 ANSWER 1 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2003:188659 USPATFULL  
TITLE: Copolymers of ethylene with various  
norbornene derivatives  
INVENTOR(S): Johnson, Lynda Kaye, Wilmington, DE, UNITED STATES  
Wang, Lin, Hockessin, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20030130452	A1	20030710
APPLICATION INFO.:	US 2002-269151	A1	20021011 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-328736P	20011012 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	

NUMBER OF CLAIMS: 6

EXEMPLARY CLAIM: 1

LINE COUNT: 1126

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Ethylene and norbornene-type monomers are efficiently copolymerized by certain metal complexes, particularly nickel complexes, containing selected anionic and neutral bidentate ligands. The polymerization process is tolerant of polar functionality on the norbornene-type monomer and can be carried out at elevated temperatures.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 2 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2001:117111 USPATFULL  
TITLE: Method for the preparation of copolymers of ethylene/norbornene-type monomers with cationic palladium catalysts  
INVENTOR(S): Goodall, Brian Leslie, Akron, OH, United States  
McIntosh, III, Lester Howard, Cuyahoga Falls, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Brecksville, OH, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6265506	B1	20010724
APPLICATION INFO.:	US 1998-94349		19980609 (9)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1997-876538, filed on 9 Jun 1997, now abandoned		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Wu, David W.		
ASSISTANT EXAMINER:	Rabago, R.		
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T., Shust, Nestor W.		
NUMBER OF CLAIMS:	15		
EXEMPLARY CLAIM:	1		
LINE COUNT:	1637		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing generally amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer. These polymers may be random or alternating, depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a cationic palladium catalyst resulting from reacting a chelating ligand with a palladium (II) compound. The catalysts employed in this invention may be represented by the formula: ##STR1##

wherein

X and Y each independently is a donor heteroatom selected from P, N, O, S and As or an organic group containing said heteroatoms, and the heteroatoms are bonded to the bridging group A;

A is a divalent group selected from an organic group and phosphorus forming together with X, Y and Pd a 4, 5, 6, or 7-membered ring, and preferably a 5-membered ring;

R is a hydrocarbyl group; and

CA is a weakly coordinating anion.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 3 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2001:33480 USPATFULL  
TITLE: Method for the preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelshtein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation

Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
The B. F. Goodrich Company, Charlotte, NC, United States (U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis, Topchiev, Russian Federation (non-U.S. corporation)

PATENT ASSIGNEE(S):

PATENT INFORMATION:

APPLICATION INFO.: US 6197984 B1 20010306

RELATED APPLN. INFO.: US 1999-305942 19990506 (9)

Division of Ser. No. US 1997-871245, filed on 9 Jun 1997, now patented, Pat. No. US 5929181

DOCUMENT TYPE: Utility

FILE SEGMENT: Granted

PRIMARY EXAMINER: Nazario-Gonzalez, Porfirio

LEGAL REPRESENTATIVE: Hudak & Shunk Co., LPA, Dunlap, Thoburn T.

NUMBER OF CLAIMS: 3

EXEMPLARY CLAIM: 1

LINE COUNT: 1345

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1##

wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 4 OF 9 USPATFULL on STN

ACCESSION NUMBER: 2000:125116 USPATFULL

TITLE: Photodefinable dielectric compositions comprising polycyclic polymers

INVENTOR(S): Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Twinsburg, OH, United States  
Elce, Edmund, Akron, OH, United States

PATENT ASSIGNEE(S): Goodall, Brian L., Akron, OH, United States  
The B. F. Goodrich Company, NY, United States (U.S. corporation)

NUMBER KIND DATE

-----  
PATENT INFORMATION: US 6121340 20000919

APPLICATION INFO.: US 1997-964080 19971104 (8)

NUMBER DATE

PRIORITY INFORMATION: US 1996-30410P 19961104 (60)

DOCUMENT TYPE: Utility

FILE SEGMENT: Granted  
PRIMARY EXAMINER: Berman, Susan W.  
LEGAL REPRESENTATIVE: Dunlap, Thoburn T.  
NUMBER OF CLAIMS: 33  
EXEMPLARY CLAIM: 1  
LINE COUNT: 3578

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to a photodefinable dielectric composition comprising a photoinitiator and a polycyclic addition polymer comprising polycyclic repeating units that contain pendant silyl functionalities containing hydrolyzable substituents. Upon exposure to a radiation source the photoinitiator catalyzes the hydrolysis of the hydrolyzable groups to effect the cure of the polymer and adhesion of the polymer to desired substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 5 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2000:24732 USPATFULL  
TITLE: Addition polymers of polycycloolefins containing silyl functional groups  
INVENTOR(S): McIntosh, III, Lester H., Cuyahoga Falls, OH, United States  
Goodall, Brian L., Akron, OH, United States  
Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Cuyahoga Falls, OH, United States  
PATENT ASSIGNEE(S): The B.F. Goodrich Company, Richfield, OH, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6031058		20000229
APPLICATION INFO.:	US 1999-263930		19990308 (9)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1995-562345, filed on 22 Nov 1995, now patented, Pat. No. US 5912313		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.		
NUMBER OF CLAIMS:	45		
EXEMPLARY CLAIM:	32		
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 7 Drawing Page(s)		
LINE COUNT:	4162		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Silyl substituted polymers of polycycloolefins are provided as well as catalyst systems for their preparation. The polymers of the invention include polycyclic repeat units that contain pendant silyl functional groups represented by the following formulae: ##STR1## wherein A is a divalent radical selected from the following structures: ##STR2## R.sup.9 independently represents hydrogen, methyl, or ethyl; R.sup.10, R.sup.11, and R.sup.12 independently represent halogen, linear or branched (C.sub.1 to C.sub.20) alkyl, linear or branched (C.sub.1 to C.sub.20) alkoxy, linear or branched (C.sub.1 to C.sub.20) alkyl carboxyloxy, (C.sub.1 to C.sub.20) alkyl peroxy, and substituted or unsubstituted (C.sub.6 to C.sub.20) aryloxy; R.sup.10, R.sup.11, and R.sup.12 together with the silicon atom to which they are attached form the group: ##STR3## n is a number from 0 to 5; and n' is 0 or 1; and n" is a number from 0 to 10.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 6 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 1999:85532 USPATFULL  
TITLE: Method for preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelshtein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation  
Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Goodall, Brian Leslie, Akron, OH, United States  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
PATENT ASSIGNEE(S): The B.F.Goodrich Co., Richfield, OH, United States  
(U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis,  
A.V.Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5929181		19990727
APPLICATION INFO.:	US 1997-871245		19970609 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Shust, Nestor W.		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	1		
LINE COUNT:	1728		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 7 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 1999:67332 USPATFULL  
TITLE: Addition polymers of polycycloolefins containing silyl functional groups  
INVENTOR(S): McIntosh, III, Lester H., Cuyahoga Falls, OH, United States  
Goodall, Brian L., Akron, OH, United States  
Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Cuyahoga Falls, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Akron, OH, United States  
(U.S. corporation)

NUMBER	KIND	DATE
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PATENT INFORMATION: US 5912313 19990615  
APPLICATION INFO.: US 1995-562345 19951122 (8)  
DOCUMENT TYPE: Utility  
FILE SEGMENT: Granted  
PRIMARY EXAMINER: Zitomer, Fred  
LEGAL REPRESENTATIVE: Dunlap, Thoburn T.  
NUMBER OF CLAIMS: 74  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 7 Drawing Figure(s); 7 Drawing Page(s)  
LINE COUNT: 4406

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Silyl substituted polymers of polycycloolefins are provided as well as catalyst systems for their preparation. The polymers of the invention include polycyclic repeat units that contain pendant silyl functional groups represented by the following formulae: ##STR1## wherein A is a divalent radical selected from the following structures: ##STR2## R.<sup>9</sup> independently represents hydrogen, methyl, or ethyl; R.<sup>10</sup>, R.<sup>11</sup>, and R.<sup>12</sup> independently represent halogen, linear or branched (C.<sub>sub.1</sub> to C.<sub>sub.20</sub>) alkyl, linear or branched (C.<sub>sub.1</sub> to C.<sub>sub.20</sub>) alkoxy, linear or branched (C.<sub>sub.1</sub> to C.<sub>sub.20</sub>) alkyl carboxyloxy, (C.<sub>sub.1</sub> to C.<sub>sub.20</sub>) alkyl peroxy, and substituted or unsubstituted (C.<sub>sub.6</sub> to C.<sub>sub.20</sub>) aryloxy; R.<sup>10</sup>, R.<sup>11</sup>, and R.<sup>12</sup> together with the silicon atom to which they are attached form the group: ##STR3## n is a number from 0 to 5; and n' is 0 or 1; and n" is a number from 0 to 10.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 8 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 81:7881 USPATFULL  
TITLE: Method for chain-opening polymerization of norbornene derivatives  
INVENTOR(S): Kotani, Teizo, Yokohama, Japan  
Matsumoto, Shuichi, Yokohama, Japan  
Igarashi, Katsutoshi, Yokohama, Japan  
Suzuki, Kazuo, Yokohama, Japan  
PATENT ASSIGNEE(S): Japan Synthetic Rubber Co., Ltd., Tokyo, Japan  
(non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4250063		19810210
APPLICATION INFO.:	US 1979-5503		19790122 (6)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1977-815320, filed on 13 Jul 1977, now abandoned		

	NUMBER	DATE
PRIORITY INFORMATION:	JP 1976-82573	19760713
	JP 1976-109413	19760914
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Smith, Edward J.	
LEGAL REPRESENTATIVE:	Oblon, Fisher, Spivak, McClelland & Maier	
NUMBER OF CLAIMS:	19	
EXEMPLARY CLAIM:	1	
LINE COUNT:	1141	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Polymers or copolymers of norbornene derivatives can be produced by

contacting in the presence or absence of an inert solvent at least one norbornene derivative substituted by at least one polar group selected from the group consisting of ester, ether, nitrile, amide, imide, acid anhydride, halogen, and silyl, or by at least one substituent having one of said polar groups; or a combination of said norbornene derivative with at least one member selected from the group consisting of cycloalkenes having no polar substituent and polymers having olefinic carbon-to-carbon double bonds; with a catalyst consisting essentially of (a) at least one coordination compound of W or Mo, the oxidation number of which is 2, 1 or 0, (b) at least one titanium tetrahalide and, if necessary, (c) at least one compound selected from the group consisting of compounds having an electron-accepting  $\pi$  bond, N-halogen-substituted cyclic acid imides, sulfides, sulfoxides and phosphines. The above-mentioned catalyst is more active, cheaper, and easier to handle than the conventional catalysts containing organoaluminum compounds.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L7 ANSWER 9 OF 9 CAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2005:271747 CAPLUS  
DOCUMENT NUMBER: 142:482376  
TITLE: Copolymerization of norbornene with ethylene catalyzed by nickel complexes with phosphor ylide ligands  
AUTHOR(S): Makovetskii, K. L.; Bykov, V. I.; Bagdasar'yan, A. Kh.; Finkel'shtein, E. Sh.; Bondarenko, G. N.; Butenko, T. A.  
CORPORATE SOURCE: Topchiev Institute of Petrochemical Synthesis, Russian Academy of Sciences, Moscow, 119991, Russia  
SOURCE: Vysokomolekulyarnye Soedineniya, Seriya A i Seriya B (2005), 47(2), 197-204  
CODEN: VSSBEE; ISSN: 1023-3091  
PUBLISHER: Izdatel'stvo Nauka  
DOCUMENT TYPE: Journal  
LANGUAGE: Russian  
AB Catalytic systems based on salts or complexes of nickel in combination with alkylaluminum chlorides that were previously used for the homopolymer of norbornene were shown to be incapable of producing norbornene copolymers with ethylene or conjugated dienes due to the efficient chain-transfer reaction. It was found that the copolymer of norbornene with ethylene proceeds under mild conditions when nickel complexes containing chelating phosphor ylide ligands, nickel-Ph bonds, and auxiliary weakly bonded ligands (pyridine or norbornene itself) are used. No co-catalysts are required for manifestation of the catalytic activity of these complexes. The ratio of norbornene and ethylene units in high-mol.-mass copolymers is close to equimolar. The feasible scheme of copolymer is discussed.

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L7 ANSWER 1 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2003:188659 USPATFULL  
TITLE: Copolymers of ethylene with various norbornene derivatives  
INVENTOR(S): Johnson, Lynda Kaye, Wilmington, DE, UNITED STATES  
Wang, Lin, Hockessin, DE, UNITED STATES

NUMBER	KIND	DATE
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PATENT INFORMATION: US 20030130452 A1 20030710  
APPLICATION INFO.: US 2002-269151 A1 20021011 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-328736P	20011012 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417 LANCASTER PIKE, WILMINGTON, DE, 19805	
NUMBER OF CLAIMS:	6	
EXEMPLARY CLAIM:	1	
LINE COUNT:	1126	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		
TI	Copolymers of ethylene with various norbornene derivatives	
SUMM	[0002] Addition copolymers of ethylene and norbornene-type monomers are well known and can be prepared using a variety of catalysts disclosed in the prior art. This general type of copolymers can be prepared using free radical catalysts disclosed in U.S. Pat. No. 3,494,897; titanium tetrachloride and diethylaluminum chloride as disclosed in DD109224 and DD222317 (VEB Leuna); or a variety of vanadium compounds, usually in combination with organoaluminum compounds, as disclosed in U.S. Pat. No. 4,614,778. The copolymers obtained with these catalysts are random copolymers.	
SUMM	[0007] U.S. Pat. No. 6,265,506 discloses a method of producing generally amorphous copolymers of ethylene and at least one norbornene-type comonomer using a cationic palladium catalyst. Copolymerizations exemplified were carried out at ambient temperature and ethylene pressures ranging from 80 to 300 psig.	
SUMM	[0008] U.S. Pat. No. 5,929,181 discloses a method for preparing generally amorphous copolymers of ethylene and norbornene-type monomers with neutral nickel catalysts. The exemplified copolymerizations were carried out at reactor temperatures ranging from 5 to 60° C., primarily at ambient temperature. In comparative copolymerizations, copolymer yields typically decreased with increasing temperature, often peaking below ambient temperature. Direct copolymerization of norbornene-type monomers containing acidic functionality was claimed, but not exemplified, with the acidic functionality always being protected prior to copolymerization.	
SUMM	[0107] Illustrative examples of suitable monomers include 2-norbornene, 5-butyl-2-norbornene, 5-methyl-2-norbornene, 5-hexyl-2-norbornene, 5-decyl-2-norbornene, 5-phenyl-2-norbornene, 5-naphthyl-2-norbornene, 5-ethylidene-2-norbornene, vinylnorbornene, dicyclopentadiene, dihydridocyclopentadiene, tetracyclododecene, methyltetracyclododecene, tetracyclododecadiene, dimethyltetracyclododecene, ethyltetracyclododecene, ethylenyl tetracyclododecene, phenyltetracyclododecene, trimers of cyclopentadiene (e.g., symmetrical and asymmetrical trimers), 5-hydroxy-2-norbornene, 5-hydroxymethyl-2-norbornene, 5-methoxy-2-norbornene, 5-t-butoxycarbonyl-2-norbornene, 5-methoxy-carbonyl-2-norbornene, 5-carboxy-2-norbornene, 5-carboxymethyl-2-norbornene, decanoic acid ester of 5-norbornene-2-methanol, octanoic acid ester of 5-norbornene-2-methanol, n-butyric acid ester of 5-norbornene-2-methanol, 5-triethoxysilyl-norbornene, 5-trichlorosilyl-norbornene, 5-trimethylsilyl	

norbornene, 5-chlorodimethylsilyl norbornene, 5-trimethoxysilyl norbornene, 5-methyldimethoxysilyl norbornene, and 5-dimethylmethoxy norbornene.

SUMM [0124] Copolymers of ethylene and norbornene-type monomers may contain "abnormal" branching (see for example previously incorporated U.S. Pat. No. 5,866,663 for an explanation of "abnormal" branching). These polymers may typically contain more than 5 methyl ended branches per 1000 methylene groups in polyethylene segments in the polymer, more typically more than 10 methyl ended branches, and most typically more than 20 methyl ended branches. Branching levels may be determined by NMR spectroscopy, see for instance previously incorporated U.S. Pat. No. 5,866,663 and other well-known references for determining branching in polyolefins. By "methyl ended branches" are meant the number of methyl groups corrected for methyl groups present as end groups in the polymer. Also not included as methyl ended branches are groups which are bound to a norbornane ring system as a side group, for example a methyl attached directly to a carbon atom which is bound to a ring atom of a norbornane ring system. These corrections are well known in the art. The branches can impart improved solubility to the ethylene copolymers, which can be advantageous for a number of purposes, including the preparation of photoresists and other materials.

SUMM [0125] The copolymers of ethylene and one or more norbornene-type comonomers produced by the process disclosed herein may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. A range of polymer morphologies can be produced with these catalysts, varying from amorphous to crystalline. The full range of norbornene incorporation (0 to 100 mol %) can be achieved as well, with about 0.1 to about 90 mol % being preferred. Typically, polymers disclosed herein contain at least one mole percent (based on the total number of all repeat units in the copolymer) of the norbornene-type monomer. Repeat units derived from one or more other copolymerizable monomers, such as alpha-olefins, may also optionally be present. Those copolymers that contain close to 50:50 mole ratio of ethylene and norbornene-type monomers will tend to be largely alternating. The copolymers range in molecular weight (Mw) from about 1,000 to about 250,000, often from about 2,000 to about 150,000.

SUMM [0128] The instant method makes it possible to prepare copolymers of ethylene with NB-type monomers containing polar substituents such as esters, ethers, silyl groups, and fluorinated alcohols and ethers, as disclosed above in greater detail. The copolymers of the present invention may be prepared from 0 to 100 percent of functional NB-type monomers or a mixture of NB-type monomers may be utilized; such mixtures may contain 1 to 99 percent of non-functional and 1 to 99 percent of functional NB-type monomers.

SUMM [0129] Copolymers of ethylene and polar norbornene-type monomers have unique physical properties not possessed by other norbornene-type polymers. Thus such polymers have especially good adhesion to various other materials, including metals and other polymers, and thus may find applicability in electrical and electronic applications. A surface made from such copolymers also has good paintability properties. In addition, certain copolymers of ethylene and polar norbornene-type monomers are useful in photoresist compositions and antireflective coatings. Copolymers of ethylene and polar norbornene-type monomers are also useful as molding resins (if thermoplastic) or as elastomers (if elastomeric).

These polar copolymers are also useful in polymer blends, particularly as compatibilizers between different types of polymers; for example polar copolymers of this invention may compatibilize blends of polyolefins such as polyethylene and more polar polymers such as poly(meth)acrylates, polyesters, or polyamides.

SUMM [0131] Copolymers of ethylene and norbornene-type monomers with lower Tg's, e.g., those containing lower amounts of norbornene-type monomers, are useful as adhesives, crosslinkers, films, impact modifiers, ionomers and the like.

DETD [0188] MeOH soluble polymer fractions were also isolated for the polymerizations of Examples 7-12. The <sup>1</sup>H NMR spectra and solubility of these fractions indicate that they have high NRBF incorporation (>50 mol % by <sup>1</sup>H NMR analysis). The homopolymer of NRBF is typically a white powder, as is the homopolymer of ethylene made by catalyst N-1a. Therefore, the appearance of these polymers as viscous oils and also their methanol-solubility is consistent with them being copolymers of NRBF and ethylene. Yield and appearance of MeOH-soluble fractions:

DETD [0195] MeOH soluble polymer fractions were also isolated for the polymerizations of Examples 13-17. The solubility of these fractions indicates that they have high NBFOH incorporation. The homopolymer of NBFOH is typically a white powder, as is the homopolymer of ethylene made by catalysts N-1a through N-4. Therefore, the appearance of these polymers as viscous oils/amorphous solids and also their methanol-solubility is consistent with them being copolymers of NBFOH and ethylene. Yield and appearance of MeOH-soluble fractions:

DETD [0202]

TABLE 6

<sup>13</sup>C NMR Branching Analysis for Some Ethylene Copolymers  
(MeOH-Insoluble Fractions) of NRBF and NBFOH and

NBE-(C(O)OMe).<sub>2</sub>

Ex	Total					<sup>13</sup> C NMR Branching Analysis		
	Me	Me	Et	Pr	Bu	Hex. eoc	Am. eoc	Bu. eoc
1	15.6	4.8	1.4	0.1	0.5	10.5	9.0	9.3
3	19.2	11.4	1.7	0.5	1.3	5.1	5.5	5.5
4	15.3	3.5	3.3	0.3	1.3	6.0	5.7	8.2
5	7.3	1.3	0.3	0.1	0.1	3.9	4.2	5.6
6	10.9	3.5	1.4	0.3	0.3	4.4	5.8	5.8
7	24.0	17.2	2.1	0.2	0.6	2.5	4.4	4.4
8	16.3	10.2	2.2	0.3	0.5	2.7	4.3	3.6
9	20.0	10.8	1.7	0.4	0.8	4.5	6.6	7.1
10	19.2	9.8	1.1	0.1	0.6	5.3	7.1	8.2
11	32.0	20.6	0.0	0.5	0.8	7.0	10.1	11.0
12	15.8	3.7	0.0	0.4	0.9	8.6	8.8	11.7
13	12.1	6.8	0.3	0.1	1.8	4.5	4.4	4.9
16	14.4	5.6	0.8	0.1	1.2	5.9	5.3	7.8
17	130.4	110.4	7.3	1.2	35.6	9.2	13.1	11.5
19	9.2	3.9	0.0	0.1	0.0	3.4	4.0	5.1
20	5.9	4.1	0.4	0.3	0.3	1.1	1.6	1.1
21	5.1	3.1	0.4	0.3	0.2	1.0	0.9	1.2
23	7.7	2.4	0.4	0.1	0.5	3.4	4.1	4.7

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L7 ANSWER 3 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 2001:33480 USPATFULL  
TITLE: Method for the preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelshtein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation  
Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Charlotte, NC, United States (U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis, Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6197984	B1	20010306
APPLICATION INFO.:	US 1999-305942		19990506 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1997-871245, filed on 9 Jun 1997, now patented, Pat. No. US 5929181		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Nazario-Gonzalez, Porfirio		
LEGAL REPRESENTATIVE:	Hudak & Shunk Co., LPA, Dunlap, Thoburn T.		
NUMBER OF CLAIMS:	3		
EXEMPLARY CLAIM:	1		
LINE COUNT:	1345		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			
TI	Method for the preparation of copolymers of ethylene /norbornene-type monomers with nickel catalysts		
AB	A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1##		
PARN	This is a divisional of application Ser. No. 08/871,245, filed on Jun. 9, 1997 U.S. Pat. No. 5,929,181, of Makovetsky et al., for METHOD FOR THE PREPARATION OF COPOLYMERS OF ETHYLENE /NORBORNENE-TYPE MONOMERS WITH NICKEL CATALYSTS.		
SUMM	Addition copolymers of ethylene and norbornene-type monomers are well known and can be prepared using a variety of catalysts disclosed in the prior art. This general type of copolymers can be prepared using free radical catalysts disclosed in U.S. Pat. No. 3,494,897 (Reding et al.); titanium tetrachloride and diethylaluminum chloride as disclosed in East German Patents 109,224 and 222,317 (VEB Leuna); or a variety of vanadium compounds, usually in combination with organoaluminum compounds, as disclosed in European Patent Application No. 156464 (Kajiura et al.). The copolymers obtained with these catalysts are random copolymers. U.S. Pat. No. 4,948,856 issued to Minchak et al. (B.F.Goodrich) discloses preparing generally alternating copolymers by the use of vanadium catalysts which are soluble in the norbornene-type monomer and a co-catalyst which may be any alkyl aluminum halide or alkylalkoxy aluminum halide. European Patent		

Application No. 0 504 418 A1 (Matsumoto et al.) discloses copolymerization of said monomers in the presence of catalysts such as transition metal compounds, including nickel compounds, and a compound which forms an ionic complex with the transition metal compound or a catalyst comprising said two compounds and an organoaluminum compound. More recently, metallocene catalysts were used to prepare copolymers of cycloolefins and  $\alpha$ -olefins as disclosed in EP 283,164 (1987) issued to Mitsui Petrochemicals and EP 407,870 (1989), EP 485,893 (1990) and EP 503,422 (1991) issued to Hoechst AG. Most recently PCT published application WO96/23010 discloses processes of polymerizing ethylene,  $\alpha$ -olefins and/or selected cyclic olefins which are catalyzed by selected transition metal compounds, including nickel complexes of diimine ligands, and sometimes also a cocatalyst. This disclosure provides, however, that when norbornene or a substituted norbornene is used, no other olefin can be present.

- SUMM It is a general object of the invention to provide a novel method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR2##
- SUMM This invention is directed to a new method of preparing substantially amorphous copolymers of ethylene and one or more norbornene (NB)-type comonomers. The resulting copolymers may be alternating or random, depending on the relative proportion of each type of monomer used. This method comprises copolymerizing said monomers in the presence of a catalyst which is a neutral nickel compound bearing a bidentate ligand which chelates the nickel via two hetero-atoms (which may be the same or different) and a hydrocarbyl group (R) or a hydride.
- SUMM Catalysts of formula I where E is phosphorus and X is oxygen have been found to preferably yield essentially alternating copolymers of norbornene and ethylene. Nevertheless at extremely high ratio of either one monomer over the other deviations from this alternating compositions are observed. When substituted norbornenes are employed, higher concentrations of the norbornenes are required to obtain the alternating compositions.
- SUMM The instant method is unique in that it makes it possible to prepare copolymers of ethylene with NB-type monomers containing functional substituents such as esters, ethers or silyl groups as disclosed below in greater detail. The catalysts employed in the prior art in the polymerization of cyclic olefins were deactivated if such monomers contained functional substituents.
- SUMM Illustrative examples of suitable monomers include 2-norbornene, 5-butyl-2-norbornene, 5-methyl-2-norbornene, 5-hexyl-2-norbornene, 5-decyl-2-norbornene, 5-phenyl-2-norbornene, 5-naphthyl-2-norbornene 5-ethylidene-2-norbornene, vinylnorbornene, dicyclopentadiene, dihydridocyclopentadiene, tetracyclododecene, methyltetracyclododecene, tetracyclododecadiene, dimethyltetracyclododecene, ethyltetracyclododecene, ethyldienyl tetracyclododecene, phenyltetracyclododecene, trimers of cyclopentadiene (e.g., symmetrical and asymmetrical trimers), 5-hydroxy-2-norbornene, 5-hydroxymethyl-2-norbornene, 5-methoxy-2-norbornene, 5-t-butoxycarbonyl-2-norbornene, 5-methoxy-carbonyl-2-norbornene, 5-carboxy-2-norbornene, 5-carboxymethyl-2-norbornene, decanoic acid

ester of 5-norbornene-2-methanol, octanoic acid ester of 5-norbornene-2-methanol, n-butyric acid ester of 5-norbornene-2-methanol, 5-triethoxysilyl-norbornene, 5-trichlorosilyl-norbornene, 5-trimethylsilyl norbornene, 5-chlorodimethylsilyl norbornene, 5-trimethoxysilyl norbornene, 5-methyldimethoxysilyl norbornene, and 5-dimethylmethoxy norbornene.

DETD Polymerization Example 2. To a clean, dry 500 mL stainless steel reactor 20.0 g of 5-butylnorbornene (133 mmol) in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.0346 g, 0.067 mmol) in toluene (5 mL). The reactor was then pressurized to 300 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 80° C.) overnight. Yield 10.5 g. M.sub.w =65,520 and M.sub.n =29,520. NMR spectroscopy confirmed the product to be a copolymer of ethylene and butylnorbornene.

DETD Polymerization Example 26. To a clean, dry 500 mL stainless steel reactor 5triethoxysilyl-norbornene (50 mL, 191 mmol) in 100 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.11 g, 0.212 mmol) in toluene (7 mL). The reactor was then pressurized to 385 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 25° C.) overnight. Yield 12.3 g. NMR spectroscopy confirmed the product to be a copolymer of ethylene and triethoxysilylnorbornene.

DETD Polymerization Example 37. To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) was then added to the reactor, followed by hexafluoroacetylacetone (0.14 mL, 1.0 mmol). The reactor was then pressurized to 250 psig with ethylene. The reaction was allowed to proceed 1 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was added to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 6.5 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene and the GPC data revealed the Mw to be 15,200 and the Mn 9,500. The glass transition temperature was determined to be 210° C. by DSC.

DETD Polymerization Example 38. To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) and hexafluoroacetylacetone (0.14 mL, 1.0 mmol) were premixed at ambient temperature for 10 minutes and then added to the reactor. The reactor was then pressurized to 400 psig with ethylene. The reaction was allowed to proceed 1 hour at which time the ethylene pressure was vented, the reactor was lowered and the solution was added

to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 2.14 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene (77 mole percent norbornene and 23 mole percent ethylene) and the GPC data revealed the Mw to be 15,700 and the Mn 6,500. The glass transition temperature was determined to be 192° C. by DSC.

DETD Polymerization Example 43. In a dry 50 mL flask 0.2569 g. (0.935 mmol) of bis(cyclooctadiene)nickel and 9 mL of dry, deoxygenated toluene were introduced under argon and 0.160 g. (0.905 mmol) of N-isobutylsalicylaldimine in 9 mL of toluene was gradually added from dropping funnel. Red-brown solution was formed. After 6 h an abundant pale brown precipitated Toluene was distilled off and a part of precipitate was dissolved in 43 mL of hexane. Greenish solution obtained contained about 0.01 mmol Ni/mL. 8 mL of this solution and 2 g. (21.3 mmol) of norbornene [NB/Ni=266] in 2 mL of hexane were introduced in a reactor and the latter was pressurized to 3.7 atm. (53 psig) with ethylene. Then the reactor was placed in a thermostat at 80° C. for 4 h. After this was cooled, the ethylene pressure was vented and the solution was poured into excess of methanol to precipitate the polymer. The latter was filtered and dried in vacuum overnight. The yield of the copolymer was 0.16 g. and proton NMR revealed that the copolymer contained 56 mole percent of norbornene and 44 mole percent of ethylene units. DSC revealed the copolymer to exhibit two glass transition points at 135 and 183° C.

=> d 17 4 ibib hit

L7	ANSWER 4 OF 9	USPATFULL	on STN
ACCESSION NUMBER:	2000:125116 USPATFULL		
TITLE:	Photodefinable dielectric compositions comprising polycyclic polymers		
INVENTOR(S):	Shick, Robert A., Strongsville, OH, United States Jayaraman, Saikumar, Twinsburg, OH, United States Elce, Edmund, Akron, OH, United States Goodall, Brian L., Akron, OH, United States		
PATENT ASSIGNEE(S):	The B. F. Goodrich Company, NY, United States (U.S. corporation)		

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6121340		20000919
APPLICATION INFO.:	US 1997-964080		19971104 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30410P	19961104 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Berman, Susan W.	
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.	
NUMBER OF CLAIMS:	33	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3578	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM As disclosed in Japanese Kokai Application No. 7-104474 to Nippon Zeon Co., Ltd. (NZ '474) attention is being directed to the polycycloolefins (e.g. polymers derived from polycyclic monomers containing a norbornene

moiety). Because of their high hydrocarbon content, polycycloolefins have low dielectric constants and low affinities for moisture. Presently, there are several routes to polymerize cyclic olefin monomers such as norbornene or other higher polycyclic monomers containing the norbornene functionality. These include: (1) ring-opening metathesis polymerization (ROMP); (2) ROMP followed by hydrogenation; (3) addition copolymerization (Ziegler type copolymers with ethylene); and (4) addition homopolymerization. Each of the foregoing routes produces polymers with specific structures as shown in the diagram below: ##STR1##

SUMM In another embodiment of the same disclosure, addition copolymers derived from cycloolefins and an  $\alpha$ -olefin such as ethylene catalyzed in the presence of a transition metal/aluminum catalyst system or addition polymers derived from cycloolefins catalyzed in the presence of transition metal/aluminum or palladium catalyst systems are post functionalized with silyl substituents via a grafting reaction. Notwithstanding the inherent deficiencies of the foregoing addition polymer backbones such as (i) the low Tg of the cycloolefin/ethylene copolymers and (ii) the insolubility of palladium catalyzed cycloaddition polymers, a further drawback is the inherent deficiencies of the post functionalization grafting reaction. As with the post functionalization of the polycyclic ROMP polymers, the amount and placement of the functional group on the backbone can not be controlled. The end result is that the silyl group can be located anywhere on the backbone where a graft reaction can occur. NZ '474 specifically teaches that the disclosed cycloaddition polymers are post functionalized with a silyl group via a conventional free radical generating mechanism. Assuming that the cycloaddition polymer was derived from the simplest of the polycyclic monomers (e.g., norbornene), the silyl functionality would have a probability of grafting to all sites on the polymer backbone that have the potential to form a free radical species (Koch, V. R.; Gleicher, G. J., J. Amer. Chem. Soc., 93:7, 1657-1661 (1971)). Accordingly, the silyl functionality can graft to any or all of the numbered sites shown below in the diagram (lower numbers indicate higher probability grafting sites). ##STR2## In spite of the hierarchy of the grafting site probabilities, the grafted product will comprise a mixture of the grafted products containing silyl functionality at one or more of the numbered sites indicated above. A major disadvantage of free radically grafted addition polymers is the propensity of the backbone to undergo cleavage or scission during the graft reaction. Free radicals generated at the repeating unit attachment sites (site 2 in the above diagram) can cause chain scission.

SUMM Minami '171 purports that the post modification of the disclosed ethylene/polycycloolefin copolymers leads to high Tg polymers (20 to 250° C.). However, the data reported in the Examples appears to suggest otherwise. The maleic anhydride, vinyltriethoxy silane, and glycidyl methacrylate graft copolymers of Examples 33 to 39 on average exhibit a 2° C. increase in Tg over their non-grafted counterparts. When taking experimental error into account, the slight overall increase in the reported Tg values are nil or insignificant at best. Contrary to the disclosure of Minami '171, high Tg polymers are not attained. In fact, the highest Tg reported in any of the Examples is only 160° C. There is no disclosure to suggest that addition polymerized silyl substituted polycyclic monomers provide polymers with superior physical and adhesive properties, especially adhesion to copper and noble metal substrates. The data reported in the examples also indicates that the highest incorporation through grafting of the vinyl triethoxy silane moiety is less than 0.1

mole %.

- DETD To a dry 100 ml glass vial containing a magnetic stirrer and a mixture of decylnorbornene (11.16 g, 0.0477 mol), and trimethylsilyl norbornene (1.36 g, 0.00531 mol) was added cyclohexane (50 ml) followed by nickel ethylhexanoate (0.026 mmol). The sample was heated to 70° C. at which point, tris-pentafluorophenyl boron (0.234 mmol) and triethylaluminum (0.260 mmol) was added under an argon atmosphere. The reaction was allowed to stir for 24 hours at room temperature after which it was terminated by injecting 5 ml of ethanol into the polymer solution. The polymer solution was then diluted with cyclohexane and precipitated with excess acetone. The precipitated polymer was filtered, washed with acetone, and dried overnight under vacuum. Polymer yield was found to be 10.1 g. The polymer was further characterized using GPC to obtain molecular weight information. The molecular weight of the polymer was found to be 51,800 g/mol (M<sub>sub.n</sub>) and 1,401,00 g/mole (M<sub>sub.w</sub>), with a polydispersity of 2.7.
- DETD To a dry 100 ml glass vial containing a magnetic stirrer and a mixture of decylnorbornene (9.923 g, 0.0424 mol ), and trimethylsilyl norbornene (2.8 ml, 0.0106 mol) was added cyclohexane (50 ml) followed by nickel ethylhexanoate (0.026 mmol). The sample was heated to 70° C. at which point, tris-pentafluorophenyl boron (0.234 mmol) and triethylaluminum (0.260 mmol) was added under an argon atmosphere. The reaction was allowed to stir for 12 hours at room temperature after which it was terminated by injecting 5 ml of ethanol into the polymer solution. The polymer solution was then diluted with cyclohexane and precipitated with excess acetone. The precipitated polymer was filtered, washed with acetone and dried overnight under vacuum. Polymer yield was found to be 7.3 g. The polymer was further characterized using GPC to obtain molecular weight information and using .sup.1 H-NMR for the copolymer composition. The molecular weight of the polymer was found to be 40,000 g/mol (M<sub>sub.n</sub>) and 109,000 g/mole (M<sub>sub.w</sub>), with a polydispersity of 2.7.

=> d 17 6 ibib hit

L7 ANSWER 6 OF 9 USPATFULL on STN  
ACCESSION NUMBER: 1999:85532 USPATFULL  
TITLE: Method for preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelshtein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation  
Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Goodall, Brian Leslie, Akron, OH, United States  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
PATENT ASSIGNEE(S): The B.F.Goodrich Co., Richfield, OH, United States  
(U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis,  
A.V.Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5929181		19990727
APPLICATION INFO.:	US 1997-871245		19970609 (8)

DOCUMENT TYPE: Utility  
FILE SEGMENT: Granted  
PRIMARY EXAMINER: Zitomer, Fred  
LEGAL REPRESENTATIVE: Shust, Nestor W.  
NUMBER OF CLAIMS: 26  
EXEMPLARY CLAIM: 1  
LINE COUNT: 1728

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

- TI Method for preparation of copolymers of ethylene /norbornene-type monomers with nickel catalysts
- AB A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.
- SUMM Addition copolymers of ethylene and norbornene-type monomers are well known and can be prepared using a variety of catalysts disclosed in the prior art. This general type of copolymers can be prepared using free radical catalysts disclosed in U.S. Pat. No. 3,494,897 (Reding et al.); titanium tetrachloride and diethylaluminum chloride as disclosed in East German Patents 109,224 and 222,317 (VEB Leuna); or a variety of vanadium compounds, usually in combination with organoaluminum compounds, as disclosed in European Patent Application No. 156464 (Kajiura et al.). The copolymers obtained with these catalysts are random copolymers. U.S. Pat. No. 4,948,856 issued to Minchak et al. (B.F.Goodrich) discloses preparing generally alternating copolymers by the use of vanadium catalysts which are soluble in the norbornene-type monomer and a co-catalyst which may be any alkyl aluminum halide or alkylalkoxy aluminum halide. European Patent Application No. 0 504 418 A1 (Matsumoto et al.) discloses copolymerization of said monomers in the presence of catalysts such as transition metal compounds, including nickel compounds, and a compound which forms an ionic complex with the transition metal compound or a catalyst comprising said two compounds and an organoaluminum compound. More recently, metallocene catalysts were used to prepare copolymers of cycloolefins and  $\alpha$ -olefins as disclosed in EP 283,164 (1987) issued to Mitsui Petrochemicals and EP 407,870 (1989), EP 485,893 (1990) and EP 503,422 (1991) issued to Hoechst AG. Most recently PCT published application W096/23010 discloses processes of polymerizing ethylene,  $\alpha$ -olefins and/or selected cyclic olefins which are catalyzed by selected transition metal compounds, including nickel complexes of diimine ligands, and sometimes also a cocatalyst. This disclosure provides, however, that when norbornene or a substituted norbornene is used, no other olefin can be present.
- SUMM It is a general object of the invention to provide a novel method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR2## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or

sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

SUMM This invention is directed to a new method of preparing substantially amorphous copolymers of ethylene and one or more norbornene (NB)-type comonomers. The resulting copolymers may be alternating or random, depending on the relative proportion of each type of monomer used. This method comprises copolymerizing said monomers in the presence of a catalyst which is a neutral nickel compound bearing a bidentate ligand which chelates the nickel via two hetero-atoms (which may be the same or different) and a hydrocarbyl group (R) or a hydride.

SUMM Catalysts of formula I where E is phosphorus and X is oxygen have been found to preferably yield essentially alternating copolymers of norbornene and ethylene. Nevertheless at extremely high ratio of either one monomer over the other deviations from this alternating compositions are observed. When substituted norbornenes are employed, higher concentrations of the norbornenes are required to obtain the alternating compositions.

SUMM The instant method is unique in that it makes it possible to prepare copolymers of ethylene with NB-type monomers containing functional substituents such as esters, ethers or silyl groups as disclosed below in greater detail. The catalysts employed in the prior art in the polymerization of cyclic olefins were deactivated if such monomers contained functional substituents.

SUMM Illustrative examples of suitable monomers include 2-norbornene, 5-butyl-2-norbornene, 5-methyl-2-norbornene, 5-hexyl-2-norbornene, 5-decyl-2-norbornene, 5-phenyl-2-norbornene, 5-naphthyl-2-norbornene 5-ethylidene-2-norbornene, vinylnorbornene, dicyclopentadiene, dihydrodicyclopentadiene, tetracyclododecene, methyltetracyclododecene, tetracyclododecadiene, dimethyltetracyclododecene, ethyltetracyclododecene, phenyltetracyclododecene, trimers of cyclopentadiene (e.g., symmetrical and asymmetric trimers), 5-hydroxy-2-norbornene, 5-hydroxymethyl-2-norbornene, 5-methoxy-2-norbornene, 5-t-butoxycarbonyl-2-norbornene, 5-methoxy-carbonyl-2-norbornene, 5-carboxy-2-norbornene, 5-carboxymethyl-2-norbornene, decanoic acid ester of 5-norbornene-2-methanol, octanoic acid ester of 5-norbornene-2-methanol, n-butyric acid ester of 5-norbornene-2-methanol, 5-triethoxysilyl-norbornene, 5-trichlorosilyl-norbornene, 5-trimethylsilyl norbornene, 5-chlorodimethylsilyl norbornene, 5-trimethoxysilyl norbornene, 5-methyldimethoxysilyl norbornene, and 5-dimethylmethoxy norbornene.

DETD To a clean, dry 500 mL stainless steel reactor 20.0 g of 5-butylnorbornene (133 mmol) in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.0346 g, 0.067 mmol) in toluene (5 mL). The reactor was then pressurized to 300 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 80° C.) overnight. Yield 10.5 g. M.sub.w

- =65,520 and M.sub.n =29,520. NMR spectroscopy confirmed the product to be a copolymer of ethylene and butylnorbornene.
- DETD To a clean, dry 500 mL stainless steel reactor 5-triethoxysilyl-norbornene (50 mL, 191 mmol) in 100 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.11 g, 0.212 mmol) in toluene (7 mL). The reactor was then pressurized to 385 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 25° C.) overnight. Yield 12.3 g. NMR spectroscopy confirmed the product to be a copolymer of ethylene and triethoxysilylnorbornene.
- DETD To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) was then added to the reactor, followed by hexafluoroacetylacetone (0.14 mL, 1.0 mmol). The reactor was then pressurized to 250 psig with ethylene. The reaction was allowed to proceed 1 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was added to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 6.5 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene and the GPC data revealed the Mw to be 15,200 and the Mn 9,500. The glass transition temperature was determined to be 210° C. by DSC.
- DETD To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) and hexafluoroacetylacetone (0.14 mL, 1.0 mmol) were premixed at ambient temperature for 10 minutes and then added to the reactor. The reactor was then pressurized to 400 psig with ethylene. The reaction was allowed to proceed 1 hour at which time the ethylene pressure was vented, the reactor was lowered and the solution was added to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 2.14 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene (77 mole percent norbornene and 23 mole percent ethylene) and the GPC data revealed the Mw to be 15,700 and the Mn 6,500. The glass transition temperature was determined to be 192° C. by DSC.
- DETD In a dry 50 mL flask 0.2569 g. (0.935 mmol) of bis(cyclooctadiene)nickel and 9 mL of dry, deoxygenated toluene were introduced under argon and 0.160 g. (0.905 mmol) of N-isobutylsalicylaldimine in 9 mL of toluene was gradually added from dropping funnel. Red-brown solution was formed. After 6 h an abundant pale brown precipitated Toluene was distilled off and a part of precipitate was dissolved in 43 mL of hexane. Greenish solution obtained contained .about.0.01 mmol Ni/mL. 8 mL of this solution and 2 g. (21.3 mmol) of norbornene [NB/Ni=266] in 2 mL of hexane were introduced in a reactor and the latter was pressurized to 3.7 atm. (53 psig) with ethylene. Then the reactor was placed in a thermostat at 80° C. for 4 h. After this was cooled, the ethylene pressure was vented and the solution was poured into excess of methanol

to precipitate the polymer. The latter was filtered and dried in vacuum overnight. The yield of the copolymer was 0.16 g. and proton NMR revealed that the copolymer contained 56 mole percent of norbornene and 44 mole percent of ethylene units. DSC revealed the copolymer to exhibit two glass transition points at 135 and 183° C.

CLM What is claimed is:

1. A method of preparing a substantially amorphous copolymer from ethylene and at least one norbornene-type monomer having the structure ##STR24## wherein R.sup.1 to R.sup.4 independently represents hydrogen, linear or branched (C.sub.1 -C.sub.10) alkyl, aromatic or saturated or unsaturated cyclic groups; a functional substituent selected from the group consisting of --(CH.sub.2).sub.n --C(O)OR, --(CH.sub.2).sub.n --OR, --(CH.sub.2).sub.n --OC(O)R, --(CH.sub.2).sub.n --C(O)R and --(CH.sub.2).sub.n --OC(O)OR, --(CH.sub.2).sub.n C(R).sub.2 CH(R)(C(O)OR), --(CH.sub.2).sub.n C(R).sub.2 CH(C(O)OR).sub.2, wherein R represents hydrogen, or linear and branched (C.sub.1 to C.sub.10) alkyl; or a silyl substituent represented as follows: ##STR25## wherein R.sup.5 independently represents hydrogen, methyl, or ethyl, R.sup.6, R.sup.7, and R.sup.8 independently represent halogen selected from bromine, chlorine, fluorine, and iodine, linear or branched (C.sub.1 to C.sub.20) alkyl, linear or branched (C.sub.1 to C.sub.20) alkoxy, linear or branched (C.sub.1 to C.sub.20) alkyl carbonyloxy, linear or branched (C.sub.1 to C.sub.20) alkyl peroxy, substituted or unsubstituted (C.sub.6 to C.sub.20) aryloxy; any of R.sup.1 and R.sup.2 or R.sup.3 and R.sup.4 when taken together can form a (C.sub.1 to C.sub.10) alkylidenyl group; m is an integer from 0 to 5; n is an integer from 0 to 10; R.sup.1 and R.sup.4, taken together with the two ring carbon atoms to which they are attached, represent a saturated cyclic group of 4 to 8 carbon atoms, wherein said cyclic group can be substituted by at least one of R.sup.2 and R.sup.3 ; said method comprising polymerizing said monomers in the presence of a neutral nickel catalyst represented by the formula ##STR26## wherein Y is a saturated or unsaturated hydrocarbyl chain containing 1 to 3 carbon atoms where two adjoining carbon atoms may form part of a cyclic structure X is O or S, E is P, As, Sb, N or O, R and R' independently is H or C.sub.1-20 hydrocarbyl, n is 0, 1 or 2, and L is a ligand bearing the heteroatom P, N or O or alternatively R and L together form part of a chelating structure.

CLM What is claimed is:

14. A method of preparing a substantially amorphous copolymer from ethylene and at least one norbornene-type monomer having the structure ##STR38## wherein R.sup.1 to R.sup.4 independently is a functional substituent selected from the group consisting of --(CH.sub.2).sub.n --C(O)OR, --(CH.sub.2).sub.n --OR, --(CH.sub.2).sub.n --OC(O)R, --(CH.sub.2).sub.n --C(O)R and --(CH.sub.2).sub.n --OC(O)OR, --(CH.sub.2).sub.n C(R).sub.2 CH(R)(C(O)OR), --(CH.sub.2).sub.n C(R).sub.2 CH(C(O)OR).sub.2, wherein R represents hydrogen, or linear and branched (C.sub.1 to C.sub.10) alkyl; or a silyl substituent represented as follows: ##STR39## wherein R.sup.5 independently represents hydrogen, methyl, or ethyl, R.sup.6, R.sup.7, and R.sup.8 independently represent halogen selected from bromine, chlorine, fluorine, and iodine, linear or branched (C.sub.1 to C.sub.20) alkyl, linear or branched (C.sub.1 to C.sub.20) alkoxy, linear or branched (C.sub.1 to C.sub.20) alkyl carbonyloxy, linear or branched (C.sub.1 to C.sub.20) alkyl peroxy, substituted or unsubstituted (C.sub.6 to C.sub.20) aryloxy; any of R.sup.1 and R.sup.2 or R.sup.3 and R.sup.4 when taken together can form a (C.sub.1 to C.sub.10) alkylidenyl group; m is an integer from 0 to 5; n is an integer from 0 to 10; R.sup.1 and

R.sup.4, taken together with the two ring carbon atoms to which they are attached, represent a saturated cyclic group of 4 to 8 carbon atoms, wherein said cyclic group can be substituted by at least one of R.sup.2 and R.sup.3 ; said method comprising polymerizing said monomers in the presence of a neutral nickel catalyst represented by the formula ##STR40## wherein Y is a saturated or unsaturated hydrocarbyl chain containing 1 to 3 carbon atoms where two adjoining carbon atoms may form part of a cyclic structure X is O or S, E is P, As, Sb, N or O, R and R' independently is H or C.sub.1-20 hydrocarbyl, n is 0, 1 or 2, and L is a ligand bearing the heteroatom P, N or O or alternatively R and L together form part of a chelating structure in which case L can be a C.dbd.C double bond.

=> s (silyl?(3a)carboxylate#)(4a)(norbornen? or bicyclo[2.2.1]heptene? or bicyclo[2.2.1]hept-2-ene?)  
L8 3 (SILYL?(3A) CARBOXYLATE#) (4A) (NORBORNEN? OR BICYCLO[2.2.1]HEPTENE? OR BICYCLO[2.2.1]HEPT-2-ENE?)

=> d 18 1-3 ibib abs

L8 ANSWER 1 OF 3 USPATFULL on STN  
ACCESSION NUMBER: 2008:172219 USPATFULL  
TITLE: MULTIPLE PATTERNING USING PATTERNABLE LOW-k DIELECTRIC MATERIALS  
INVENTOR(S): Lin, Qinghuang, Yorktown Heights, NY, UNITED STATES  
PATENT ASSIGNEE(S): INTERNATIONAL BUSINESS MACHINES CORPORATION, Armonk, NY, UNITED STATES (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20080150091	A1	20080626
APPLICATION INFO.:	US 2008-29848	A1	20080212 (12)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 2004-821044, filed on 8 Apr 2004, Pat. No. US 7355384		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	SCULLY, SCOTT, MURPHY & PRESSER, P.C., 400 GARDEN CITY PLAZA, SUITE 300, GARDEN CITY, NY, 11530, US		
NUMBER OF CLAIMS:	25		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	2 Drawing Page(s)		
LINE COUNT:	1334		
AB	A method of double patterning a semiconductor structure with a single material which after patterning becomes a permanent part of the semiconductor structure. More specifically, a method to form a patterned semiconductor structure with small features is provided which are difficult to obtain using conventional exposure lithographic processes. The method of the present invention includes the use of patternable low-k dielectric materials which after patterning remain as a low k dielectric material within the semiconductor structure. The method is useful in forming semiconductor interconnect structures in which the patternable low k dielectric materials after patterning and curing become a permanent element, e.g., a patterned interlayer low k dielectric material, of the interconnect structure.		

L8 ANSWER 2 OF 3 USPATFULL on STN  
ACCESSION NUMBER: 2001:107815 USPATFULL

TITLE: Method of forming a patterned organic dielectric layer on a substrate  
INVENTOR(S): Lin, Qinghuang, Wappingers Falls, NY, United States  
Mih, Rebecca D., Wappingers Falls, NY, United States  
Petrarca, Kevin S., Newburgh, NY, United States  
PATENT ASSIGNEE(S): International Business Machines Corporation, Armonk, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6258732	B1	20010710
APPLICATION INFO.:	US 1999-244936		19990204 (9)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Nelms, David		
ASSISTANT EXAMINER:	Berry, Renee' R.		
LEGAL REPRESENTATIVE:	Scully, Scott, Murphy & Presser, Capella, Esq., Steven		
NUMBER OF CLAIMS:	23		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	488		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An organic dielectric material is patterned on a substrate in a process utilizing a patterned resist which contains a metalloid or metallic element at the time of pattern transfer to the organic dielectric layer. The organic dielectric layer is preferably patterned using an oxygen etching process, most preferably oxygen reactive ion etching. The process advantageously avoids the need for a hard mask.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 3 OF 3 USPATFULL on STN  
ACCESSION NUMBER: 2001:47730 USPATFULL  
TITLE: Resist composition and process of forming a patterned resist layer on a substrate  
INVENTOR(S): Lin, Qinghuang, Wappingers Falls, NY, United States  
Hughes, Timothy M., Marlboro, NY, United States  
Jordhamo, George M., Hopewell Junction, NY, United States  
Katnani, Ahmad D., Poughkeepsie, NY, United States  
Moreau, Wayne M., Wappingers Falls, NY, United States  
Patel, Niranjan, Fremont, CA, United States  
PATENT ASSIGNEE(S): International Business Machines Corporation, Armonk, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6210856	B1	20010403
APPLICATION INFO.:	US 1999-238823		19990127 (9)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Chu, John S.		
ASSISTANT EXAMINER:	Clarke, Yvette M.		
LEGAL REPRESENTATIVE:	Scully, Scott, Murphy & Presser, Capella, Esq., Steven		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	1		
LINE COUNT:	691		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A radiation sensitive resist composition exhibiting high resolution and enhanced etch resistance comprising a silicon containing polymeric

additive, a non-silicon containing base polymer, a photoacid generator and a base is provided. A method of forming a patterned resist film is also provided. A resist film having an upper surface region enriched with silicon is also disclosed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> d 18 3 ibib hit

L8 ANSWER 3 OF 3 USPATFULL on STN  
ACCESSION NUMBER: 2001:47730 USPATFULL  
TITLE: Resist composition and process of forming a patterned resist layer on a substrate  
INVENTOR(S): Lin, Qinghuang, Wappingers Falls, NY, United States  
Hughes, Timothy M., Marlboro, NY, United States  
Jordhamo, George M., Hopewell Junction, NY, United States  
Katnani, Ahmad D., Poughkeepsie, NY, United States  
Moreau, Wayne M., Wappingers Falls, NY, United States  
Patel, Niranjan, Fremont, CA, United States  
PATENT ASSIGNEE(S): International Business Machines Corporation, Armonk, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6210856	B1	20010403
APPLICATION INFO.:	US 1999-238823		19990127 (9)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Chu, John S.		
ASSISTANT EXAMINER:	Clarke, Yvette M.		
LEGAL REPRESENTATIVE:	Scully, Scott, Murphy & Presser, Capella, Esq., Steven		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	1		
LINE COUNT:	691		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM Preferred monomers containing silicon-containing substituents are trimethylsilyl alkyl acrylate, trimethylsilyl alkyl methacrylate, trimethylsilyl alkyl itaconate, tris(trimethylsilyl)silyl alkyl acrylate tris(trimethylsilyl)silyl alkyl methacrylate, tris(trimethylsilyl)silyl alkyl itaconate, tris(trimethylsilyloxy)silyl alkyl acrylate, tris(trimethylsilyloxy)silyl alkyl methacrylate, tris(trimethylsilyloxy)silyl alkyl itaconate, alkylsilyl styrene, trimethylsilylmethyl(dimethoxy)silyloxy alkyl acrylate, trimethylsilylmethyl(dimethoxy)silyloxy alkyl methacrylate, trimethylsilylmethyl(dimethoxy)silyloxy alkyl itaconate, trimethylsilyl alkyl norbornene-5-carboxylate alkyl, tris(trimethylsilyl)silyl alkyl norbornene-5-carboxylate and tris(trimethylsilyloxy)silyl alkyl norbornene-5-carboxylate, wherein alkyl is a C.sub.1-5 moiety.

=> d his

(FILE 'HOME' ENTERED AT 16:09:55 ON 12 DEC 2008)  
SET ABBR ON PERM  
SET PLURALS ON PERM

S/N 10/578,138

FILE 'INPADOCDB, CAPLUS' ENTERED AT 16:10:26 ON 12 DEC 2008

L1 1 S WO 1999/014635/PN  
L2 2 S EP 1021750/PN

FILE 'STNGUIDE' ENTERED AT 16:12:44 ON 12 DEC 2008

FILE 'USPATFULL, USPATOLD, USPAT2, CAPLUS, JAPIO' ENTERED AT 16:16:33 ON 12 DEC 2008

L3 0 S TRIMETHYLSILYL!!!!!!!!!!!!TETRACYCLO!!!!!!CARBOXYLATE  
L4 0 S TRIMETHYLSILYL!!!!!!!!!!!!TETRACYCLO!!!!!! CARBOXYLATE  
L5 66 S TRIMETHYLSILYL(1W)NORBORNEN?  
L6 329756 S (ETHYLENE OR ETHENE) (4A) (COPOLYMER# OR TERPOLYMER#)  
L7 9 S L5 AND L6  
L8 3 S (SILYL?(3A)CARBOXYLATE#) (4A) (NORBORNEN? OR BICYCLO[2.2.1]HEPT

=> s (trimethoxysilyl? or trialkoxsilyl? or alkoxysilyl?) (2a) norbornen?  
L9 92 (TRIMETHOXYSILYL? OR TRIALKOXSILYL? OR ALKOXYSILYL?) (2A) NORBORNEN?

=> s 16 and 19  
L10 27 L6 AND L9

=> d 110 1-27 ibib abs

L10 ANSWER 1 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2007:128801 USPATFULL  
TITLE: Novel (co)polymer, process for producing the same, and process for producing carboxylated (co)polymer  
INVENTOR(S): Hayakawa, Toshiyuki, Tokyo, JAPAN  
Hattori, Iwakazu, Tokyo, JAPAN  
Ookubo, Akihiko, Tokyo, JAPAN  
PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN, 104-0045 (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20070112158	A1	20070517
APPLICATION INFO.:	US 2004-578138	A1	20041115 (10)
	WO 2004-JP16944		20041115
			20060503 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2003-387656	20031118
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940 DUKE STREET, ALEXANDRIA, VA, 22314, US	
NUMBER OF CLAIMS:	10	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	1 Drawing Page(s)	
LINE COUNT:	1536	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Disclosed herein are a novel (co)polymer having a silyl carboxylate residue, a production process thereof and a production process of a carboxyl group-containing (co) polymer. A (co)polymer of the invention comprises a structural unit represented by the following general formula (1). Another (co)polymer of the invention comprises a structural unit represented by the following general formula (2). ##STR1## wherein

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n is 0 or 1, R.sup.1, R.sup.2, R.sup.3 and R.sup.4 mean, independently of one another, a hydrogen atom, halogen atom or monovalent organic group, and X denotes an ethylene or vinylene group.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 2 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2006:47619 USPATFULL  
TITLE: Polycycloolefin polymeric compositions for semiconductor applications  
INVENTOR(S): Ravikiran, Ramakrishna, Strongsville, OH, UNITED STATES  
Ng., Hendra, Highland Heights, OH, UNITED STATES  
Puthenkovilakom, Rajesh Raja, North Royalton, OH, UNITED STATES  
Zhang, Linda, Broadview Heights, OH, UNITED STATES  
Amoroso, Dino, Medina, OH, UNITED STATES  
Knapp, Brian, Medina, OH, UNITED STATES  
Bell, Andrew, Lakewood, OH, UNITED STATES  
Rhodes, Larry F., Silver Lake, OH, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20060041093	A1	20060223
APPLICATION INFO.:	US 2005-204685	A1	20050816 (11)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2004-602364P	20040818 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	Nestor W. Shust, Hudak, Shunk & Farine Co. L.P.A., Suite 307, 2020 Front St., Cuyahoga Falls, OH, 44221, US	
NUMBER OF CLAIMS:	26	
EXEMPLARY CLAIM:	1	
LINE COUNT:	1624	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Polymeric compositions for semiconductor applications comprising 10 to 99 weight % of norbornene-type cycloolefin monomers represented by one or more of Formulae I(a), I(b), and optionally I(c) and/or I(d), 0.0005 to 0.5 weight % of an addition polymerization procatalyst, and optionally: up to 0.5 weight % of a cocatalyst, up to 59 weight % of a crosslinking monomer, up to 50 weight % of a viscosifier, up to 20 weight % of a thixotropic additive(s), up to 80 weight % of a filler, up to 10 weight % of an antioxidant, and up to 0.6 weight % of an antioxidant synergist, the total of the components of the formulation adding up to 100%. Such formulations are mass polymerized, or cured, to form polymeric compositions that have properties desirable for a variety of specific electronic, microelectronic, optoelectronic and micro-optoelectronic applications such as die attach adhesives, underfill materials, prepreg binders, encapsulants, protective layers, and other related applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 3 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2005:259858 USPATFULL  
TITLE: Objective lens and optical pickup apparatus  
INVENTOR(S): Ohta, Tatsuo, Otsuki-shi, JAPAN  
Nozaki, Takashi, Tokyo, JAPAN

S/N 10/578,138

PATENT ASSIGNEE(S): KONICA MINOLTA OPTO, INC. (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20050225879	A1	20051013
	US 7161744	B2	20070109
APPLICATION INFO.:	US 2005-97159	A1	20050404 (11)

  

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2004-113166	20040407
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP, 901 NEW YORK AVENUE, NW, WASHINGTON, DC, 20001-4413, US	
NUMBER OF CLAIMS:	15	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Page(s)	
LINE COUNT:	3976	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB An objective lens for converging a monochromatic light flux having a specific wavelength in a range of 350 to 450 nm on an optical information recording medium while the objective lens is placed facing the optical information recording medium, the objective lens comprising: a lens body containing a polymer resin having an alicyclic structure; a first film having a refractive index of less than 1.7 for light having a wavelength of 405 nm; a second film having a refractive index of 1.7 or more for the light having the wavelength of 405 nm; and a third film having a refractive index of 1.55 or less for the light having the wavelength of 405 nm, wherein: the first film, the second film and the third film are provided on the lens body; the first film is provided between the lens body and the second film; the second film is provided between the first film and the third film; and a thickness of the first film is in a range of 50 to 15000 nm.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 4 OF 27 USPATFULL on STN

ACCESSION NUMBER: 2005:253191 USPATFULL

TITLE: Objective lens and optical pickup apparatus

INVENTOR(S): Ohta, Tatsuo, Otsuki-shi, JAPAN

Nozaki, Takashi, Tokyo, JAPAN

PATENT ASSIGNEE(S): KONICA MINOLTA OPTO, INC. (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20050219683	A1	20051006
APPLICATION INFO.:	US 2005-92808	A1	20050330 (11)

  

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2004-109917	20040402
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER, LLP, 901 NEW YORK AVENUE, NW, WASHINGTON, DC, 20001-4413, US	
NUMBER OF CLAIMS:	19	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	5 Drawing Page(s)	
LINE COUNT:	3815	

AB An objective lens for converging a monochromatic light flux having a specific wavelength in a range of 350 to 450 nm on an optical information recording medium while the objective lens is placed facing the optical information recording medium, the objective lens containing a lens body made of a polymer resin having an alicyclic structure; and an antireflection film including one or more layers provided on a surface of the lens body facing to the optical information recording medium, wherein a refractive index of the antireflection film for a light flux having a wavelength of 405 nm is less than 1.7.

L10 ANSWER 5 OF 27 USPATFULL on STN

ACCESSION NUMBER: 2005:125162 USPATFULL

TITLE: Cyclic olefin addition copolymer and process for producing same, crosslinking composition, crosslinked product and process for producing same, and optically transparent material and application thereof

INVENTOR(S):  
Oshima, Noboru, Tokyo, JAPAN  
Maruyama, Yooichiroh, Tokyo, JAPAN  
Kaizu, Michitaka, Tokyo, JAPAN  
Sawada, Katsutoshi, Tokyo, JAPAN  
Hayashi, Toshihiro, Tokyo, JAPAN  
Ohkita, Kenzo, Tokyo, JAPAN

PATENT ASSIGNEE(S): JSR CORPORATION, Chuo-ku, JAPAN (non-U.S. corporation)

NUMBER	KIND	DATE
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PATENT INFORMATION: US 20050107552 A1 20050519  
US 6992154 B2 20060131

APPLICATION INFO.: US 2004-969065 A1 20041021 (10)

RELATED APPLN. INFO.: Division of Ser. No. US 2002-241578, filed on 12 Sep 2002, GRANTED, Pat. No. US 6844403

NUMBER	DATE
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PRIORITY INFORMATION: JP 2001-277847 20010913  
JP 2001-336593 20011101  
JP 2002-15388 20020124

DOCUMENT TYPE: Utility

FILE SEGMENT: APPLICATION

LEGAL REPRESENTATIVE: OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940 DUKE STREET, ALEXANDRIA, VA, 22314, US

NUMBER OF CLAIMS: 16

EXEMPLARY CLAIM: 1-22

NUMBER OF DRAWINGS: 12 Drawing Page(s)

LINE COUNT: 1998

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides a cyclic olefin addition copolymer which has a reactive silyl group having a specific structure, excels in optical transparency, heat resistance, and adhesion, and is capable of producing a crosslinked product having improved dimensional stability, solvent resistance, and chemical resistance. The present invention also provides a process for producing the cyclic olefin addition copolymer, a crosslinking composition, a crosslinked product and a process for producing the same, and an optically transparent material (transparent resin film) comprising the cyclic olefin addition copolymer. The optically transparent material excels in optical transparency and heat resistance, exhibits improved dimensional stability, adhesion, solvent resistance, and chemical resistance, and is capable of improving fragility and preventing occurrence of cracks in the film.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 6 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2004:308106 USPATFULL  
TITLE: Rubber composition and vulcanized rubber  
INVENTOR(S): Nakano, Sadayuki, Ichihara-shi, JAPAN  
Sassa, Tatsuo, Ichihara-shi, JAPAN  
Kawashima, Jun, Ichihara-shi, JAPAN  
PATENT ASSIGNEE(S): SUMITOMO CHEMICAL COMPANY, LIMITED (non-U.S.  
corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20040242782	A1	20041202
APPLICATION INFO.:	US 2004-852154	A1	20040525 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2003-152083	20030529
	JP 2003-152084	20030529
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	SUGHRUE MION, PLLC, 2100 PENNSYLVANIA AVENUE, N.W., SUITE 800, WASHINGTON, DC, 20037	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
LINE COUNT:	693	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A rubber composition comprising the following components (A), (B1) or (B2), and (C):

(A) an ethylene- $\alpha$ -olefin copolymer rubber  
and/or an ethylene- $\alpha$ -olefin-non-conjugated diene  
copolymer rubber,

(B1) an organic compound having a weight average molecular weight of  
from 1,000 to 1,000,000, and containing a silicon atom in an amount of  
from 2 to 30% by weight, wherein the total amount of the organic  
compound is 100% by weight, or (B2) an ethylene  
- $\alpha$ -olefin-silylnorbornene copolymer rubber, and

(C) a reinforcement; and vulcanized rubber produced by a process  
comprising the step of vulcanizing said rubber composition.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 7 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2004:139564 USPATFULL  
TITLE: Resin film and applications thereof  
INVENTOR(S): Kanamori, Tarou, Tokyo, JAPAN  
Kawahara, Kouji, Tokyo, JAPAN  
Hashiguchi, Yuuichi, Tokyo, JAPAN  
Maruyama, Yooichiroh, Tokyo, JAPAN  
Oshima, Noboru, Tokyo, JAPAN  
PATENT ASSIGNEE(S): JSR CORPORATION, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20040106740	A1	20040603

APPLICATION INFO.: US 6790914 B2 20040914  
US 2002-305959 A1 20021129 (10)  
DOCUMENT TYPE: Utility  
FILE SEGMENT: APPLICATION  
LEGAL REPRESENTATIVE: OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940  
DUKE STREET, ALEXANDRIA, VA, 22314  
NUMBER OF CLAIMS: 20  
EXEMPLARY CLAIM: 1  
LINE COUNT: 1839

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A film for a display device produced by using a transparent (crosslinked) resin film formed of a composition including a cyclic olefin addition copolymer of the present invention has optical transparency, heat resistance, liquid crystal resistance, dimensional stability, and adhesion and is suitably used as an alternative to a glass substrate of a liquid crystal display device and an EL display device. The transparent (crosslinked) resin film can be used as a polarizing film, surface protective film, retardation film, transparent conductive film, light diffusion film, film for an EL display device, transparent conductive composite material, antireflection film, and the like.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 8 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2004:83417 USPATFULL  
TITLE: Processes for producing cycloolefin addition polymer  
INVENTOR(S): Ohkita, Kenzo, Tokyo, JAPAN  
Oshima, Noboru, Tokyo, JAPAN  
Imamura, Takashi, Tokyo, JAPAN  
Tsubouchi, Takashi, Tokyo, JAPAN

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20040063873	A1	20040401
	US 6911507	B2	20050628
APPLICATION INFO.:	US 2003-466429	A1	20030716 (10)
	WO 2002-JP453		20020123

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-15318	20010124
	JP 2001-227248	20010727
	JP 2001-227249	20010727
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940 DUKE STREET, ALEXANDRIA, VA, 22314	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
LINE COUNT:	1454	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A cyclic olefin having a specific polar group is polymerized by addition polymerization in a hydrocarbon solvent, using a polymerization catalyst component containing (i) a specific transition metal compound, (ii) a Lewis acid compound and (iii) an alkyl aluminoxane, or the cyclic olefin is polymerized by addition polymerization in the hydrocarbon solvent, using the polymerization catalyst component, by further adding at least one aromatic vinyl compound and at least one cyclic nonconjugated polyene compound, or either one of them as a molecular weight modifier,

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thereby obtaining a cyclic olefinic addition polymer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 9 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2004:11278 USPATFULL  
TITLE: Self-healing polymer compositions  
INVENTOR(S): Skipor, Andrew, West Chicago, IL, UNITED STATES  
Scheifer, Steve, Hoffman Estates, IL, UNITED STATES  
Olson, Bill, Lake Villa, IL, UNITED STATES  
PATENT ASSIGNEE(S): Motorola, Inc. (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20040007784	A1	20040115
	US 7108914	B2	20060919
APPLICATION INFO.:	US 2002-195858	A1	20020715 (10)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	FITCH EVEN TABIN AND FLANNERY, 120 SOUTH LA SALLE STREET, SUITE 1600, CHICAGO, IL, 60603-3406		
NUMBER OF CLAIMS:	42		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	5 Drawing Page(s)		
LINE COUNT:	1111		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A self-healing polymer composition 10 containing a polymer media 12 and a plurality of microcapsules of flowable polymerizable material 16 dispersed in the polymer media 12, where the microcapsules of flowable polymerizable material 16 contain a flowable polymerizable material 15 and have an outer surface 142 upon which at least one polymerization agent 13 is attached. The microcapsules 16 are effective for rupturing with a failure of the polymeric media 12, and the flowable polymerizable material 15 reacts with the polymerization agent 13 when the polymerizable material 15 makes contact with the polymerization agent 13 upon rupture of the microcapsules 14. There is also provided a method of using the self-healing polymeric composition 10 to repair fractures in polymers, as well as articles of manufacture including the self-healing system, and the microencapsulated polymerizable particles 16 themselves.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 10 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2003:188659 USPATFULL  
TITLE: Copolymers of ethylene with various norbornene derivatives  
INVENTOR(S): Johnson, Lynda Kaye, Wilmington, DE, UNITED STATES  
Wang, Lin, Hockessin, DE, UNITED STATES

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20030130452	A1	20030710
APPLICATION INFO.:	US 2002-269151	A1	20021011 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	US 2001-328736P	20011012 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	E I DU PONT DE NEMOURS AND COMPANY, LEGAL PATENT	

RECORDS CENTER, BARLEY MILL PLAZA 25/1128, 4417  
LANCASTER PIKE, WILMINGTON, DE, 19805

NUMBER OF CLAIMS:

6

EXEMPLARY CLAIM:

1

LINE COUNT:

1126

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Ethylene and norbornene-type monomers are efficiently copolymerized by certain metal complexes, particularly nickel complexes, containing selected anionic and neutral bidentate ligands. The polymerization process is tolerant of polar functionality on the norbornene-type monomer and can be carried out at elevated temperatures.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 11 OF 27 USPATFULL on STN

ACCESSION NUMBER: 2003:174113 USPATFULL

TITLE:

Cyclic olefin addition copolymer and process for producing same, crosslinking composition, crosslinked product and process for producing same, and optically transparent material and application thereof

INVENTOR(S):

Oshima, Noboru, Tokyo, JAPAN  
Maruyama, Yooichiroh, Tokyo, JAPAN  
Kaizu, Michitaka, Tokyo, JAPAN  
Sawada, Katsutoshi, Tokyo, JAPAN  
Hayashi, Toshihiro, Tokyo, JAPAN  
Ohkita, Kenzo, Tokyo, JAPAN

PATENT ASSIGNEE(S):

JSR CORPORATION, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20030119961	A1	20030626
	US 6844403	B2	20050118
APPLICATION INFO.:	US 2002-241578	A1	20020912 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-277847	20010913
	JP 2001-336593	20011101
	JP 2002-15388	20020124
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C., 1940 DUKE STREET, ALEXANDRIA, VA, 22314	
NUMBER OF CLAIMS:	37	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	12 Drawing Page(s)	
LINE COUNT:	2257	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides a cyclic olefin addition copolymer which has a reactive silyl group having a specific structure, excels in optical transparency, heat resistance, and adhesion, and is capable of producing a crosslinked product having improved dimensional stability, solvent resistance, and chemical resistance. The present invention also provides a process for producing the cyclic olefin addition copolymer, a crosslinking composition, a crosslinked product and a process for producing the same, and an optically transparent material (transparent resin film) comprising the cyclic olefin addition copolymer. The optically transparent material excels in optical transparency and heat resistance, exhibits improved dimensional stability, adhesion, solvent resistance, and chemical resistance, and is capable of improving

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fragility and preventing occurrence of cracks in the film.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 12 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2002:236190 USPATFULL  
TITLE: Thermoplastic resin composition and shaped articles thereof  
INVENTOR(S): Zen, Shinichiro, Tokyo, JAPAN  
Shimizu, Akira, Mie-Ken, JAPAN  
PATENT ASSIGNEE(S): JSR CORPORATION, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20020128392	A1	20020912
	US 6562908	B2	20030513
APPLICATION INFO.:	US 2002-40351	A1	20020109 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-3745	20010111
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	OBLON SPIVAK MCCLELLAND MAIER & NEUSTADT PC, FOURTH FLOOR, 1755 JEFFERSON DAVIS HIGHWAY, ARLINGTON, VA, 22202	
NUMBER OF CLAIMS:	11	
EXEMPLARY CLAIM:	1	
LINE COUNT:	974	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Described are a thermoplastic resin composition containing (A): one or more rubber reinforced thermoplastic resins, (B): one or more acrylic resins and (C): one or more thermoplastic norbornene resins, and further containing (D): one or more styrenic resins other than (A) and (E): coloring agents as needed, and a shaped article obtained by forming the composition. Described thermoplastic resin composition is excellent in heat resistance, strength and processability, and excellent in laser marking properties, so that it is useful for various applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 13 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2001:117111 USPATFULL  
TITLE: Method for the preparation of copolymers of ethylene/norbornene-type monomers with cationic palladium catalysts  
INVENTOR(S): Goodall, Brian Leslie, Akron, OH, United States  
McIntosh, III, Lester Howard, Cuyahoga Falls, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Brecksville, OH, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6265506	B1	20010724
APPLICATION INFO.:	US 1998-94349		19980609 (9)
RELATED APPLN. INFO.:			Continuation-in-part of Ser. No. US 1997-876538, filed on 9 Jun 1997, now abandoned
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		

PRIMARY EXAMINER: Wu, David W.  
ASSISTANT EXAMINER: Rabago, R.  
LEGAL REPRESENTATIVE: Dunlap, Thoburn T., Shust, Nestor W.  
NUMBER OF CLAIMS: 15  
EXEMPLARY CLAIM: 1  
LINE COUNT: 1637

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing generally amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer. These polymers may be random or alternating, depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a cationic palladium catalyst resulting from reacting a chelating ligand with a palladium (II) compound. The catalysts employed in this invention may be represented by the formula: ##STR1##

wherein

X and Y each independently is a donor heteroatom selected from P, N, O, S and As or an organic group containing said heteroatoms, and the heteroatoms are bonded to the bridging group A;

A is a divalent group selected from an organic group and phosphorus forming together with X, Y and Pd a 4, 5, 6, or 7-membered ring, and preferably a 5-membered ring;

R is a hydrocarbyl group; and

CA is a weakly coordinating anion.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 14 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2001:33480 USPATFULL  
TITLE: Method for the preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelstein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation  
Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, Charlotte, NC, United States (U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis, Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6197984	B1	20010306
APPLICATION INFO.:	US 1999-305942		19990506 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1997-871245, filed on 9 Jun 1997, now patented, Pat. No. US 5929181		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Nazario-Gonzalez, Porfirio		
LEGAL REPRESENTATIVE:	Hudak & Shunk Co., LPA, Dunlap, Thoburn T.		

NUMBER OF CLAIMS: 3  
EXEMPLARY CLAIM: 1  
LINE COUNT: 1345

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1##

wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 15 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2000:125116 USPATFULL  
TITLE: Photodefinaible dielectric compositions comprising polycyclic polymers  
INVENTOR(S): Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Twinsburg, OH, United States  
Elce, Edmund, Akron, OH, United States  
Goodall, Brian L., Akron, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6121340		20000919
APPLICATION INFO.:	US 1997-964080		19971104 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30410P	19961104 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Berman, Susan W.	
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.	
NUMBER OF CLAIMS:	33	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3578	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention relates to a photodefinaible dielectric composition comprising a photoinitiator and a polycyclic addition polymer comprising polycyclic repeating units that contain pendant silyl functionalities containing hydrolyzable substituents. Upon exposure to a radiation source the photoinitiator catalyzes the hydrolysis of the hydrolyzable groups to effect the cure of the polymer and adhesion of the polymer to desired substrates.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 16 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2000:24732 USPATFULL

TITLE: Addition polymers of polycycloolefins containing silyl functional groups  
INVENTOR(S): McIntosh, III, Lester H., Cuyahoga Falls, OH, United States  
Goodall, Brian L., Akron, OH, United States  
Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Cuyahoga Falls, OH, United States  
PATENT ASSIGNEE(S): The B.F. Goodrich Company, Richfield, OH, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6031058		20000229
APPLICATION INFO.:	US 1999-263930		19990308 (9)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1995-562345, filed on 22 Nov 1995, now patented, Pat. No. US 5912313		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.		
NUMBER OF CLAIMS:	45		
EXEMPLARY CLAIM:	32		
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 7 Drawing Page(s)		
LINE COUNT:	4162		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			

AB Silyl substituted polymers of polycycloolefins are provided as well as catalyst systems for their preparation. The polymers of the invention include polycyclic repeat units that contain pendant silyl functional groups represented by the following formulae: ##STR1## wherein A is a divalent radical selected from the following structures: ##STR2## R.sup.9 independently represents hydrogen, methyl, or ethyl; R.sup.10, R.sup.11, and R.sup.12 independently represent halogen, linear or branched (C.sub.1 to C.sub.20) alkyl, linear or branched (C.sub.1 to C.sub.20) alkoxy, linear or branched (C.sub.1 to C.sub.20) alkyl carboxyloxy, (C.sub.1 to C.sub.20) alkyl peroxy, and substituted or unsubstituted (C.sub.6 to C.sub.20) aryloxy; R.sup.10, R.sup.11, and R.sup.12 together with the silicon atom to which they are attached form the group: ##STR3## n is a number from 0 to 5; and n' is 0 or 1; and n" is a number from 0 to 10.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 17 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 1999:85532 USPATFULL  
TITLE: Method for preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
Finkelshtein, Eugeny Shmerovich, Moscow, Russian Federation  
Bykov, Viktor Ivanovich, Moscow, Russian Federation  
Bagdasaryan, Andrey Khristoforovich, Moscow, Russian Federation  
Goodall, Brian Leslie, Akron, OH, United States  
Rhodes, Larry Funderburk, Silver Lake, OH, United States  
PATENT ASSIGNEE(S): The B.F.Goodrich Co., Richfield, OH, United States  
(U.S. corporation)  
A.V. Topchiev Institute of Petrochemical Synthesis,  
A.V.Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5929181		19990727
APPLICATION INFO.:	US 1997-871245		19970609 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Shust, Nestor W.		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	1		
LINE COUNT:	1728		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 18 OF 27 USPATFULL on STN  
 ACCESSION NUMBER: 1999:67332 USPATFULL  
 TITLE: Addition polymers of polycycloolefins containing silyl functional groups  
 INVENTOR(S): McIntosh, III, Lester H., Cuyahoga Falls, OH, United States  
                   Goodall, Brian L., Akron, OH, United States  
                   Shick, Robert A., Strongsville, OH, United States  
                   Jayaraman, Saikumar, Cuyahoga Falls, OH, United States  
 PATENT ASSIGNEE(S): The B. F. Goodrich Company, Akron, OH, United States  
                   (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5912313		19990615
APPLICATION INFO.:	US 1995-562345		19951122 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.		
NUMBER OF CLAIMS:	74		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 7 Drawing Page(s)		
LINE COUNT:	4406		

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Silyl substituted polymers of polycycloolefins are provided as well as catalyst systems for their preparation. The polymers of the invention include polycyclic repeat units that contain pendant silyl functional groups represented by the following formulae: ##STR1## wherein A is a divalent radical selected from the following structures: ##STR2## R.<sup>9</sup> independently represents hydrogen, methyl, or ethyl; R.<sup>10</sup>, R.<sup>11</sup>, and R.<sup>12</sup> independently represent halogen, linear or

branched (C.sub.1 to C.sub.20) alkyl, linear or branched (C.sub.1 to C.sub.20) alkoxy, linear or branched (C.sub.1 to C.sub.20) alkyl carbonyloxy, (C.sub.1 to C.sub.20) alkyl peroxy, and substituted or unsubstituted (C.sub.6 to C.sub.20) aryloxy; R.sup.10, R.sup.11, and R.sup.12 together with the silicon atom to which they are attached form the group: ##STR3## n is a number from 0 to 5; and n' is 0 or 1; and n" is a number from 0 to 10.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 19 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 75:62560 USPATFULL  
TITLE: Process for the production of polymeric hydrocarbons with reactive silyl side groups  
INVENTOR(S): Streck, Roland, United States  
PATENT ASSIGNEE(S): Weber, Heinrich, Marl, Germany, Federal Republic of (non-U.S. corporation)  
Chemische Werke Huels Aktiengesellschaft, Marl, Germany, Federal Republic of (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 3920714		19751118
APPLICATION INFO.:	US 1974-452663		19740319 (5)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1972-306989, filed on 16 Nov 1972, now patented, Pat. No. US 3857825		

	NUMBER	DATE
PRIORITY INFORMATION:	DE 1973-2314543	19730323
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Shaver, Paul F.	
LEGAL REPRESENTATIVE:	Millen, Raptes & White	
NUMBER OF CLAIMS:	11	
EXEMPLARY CLAIM:	1	
LINE COUNT:	791	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A process for the production of polymeric hydrocarbons having reactive silyl side groups, characterized in that cycloolefins which can be polymerized under ring opening, and which carry at least one reactive silyl group on the cycloolefin skeleton, are metathetically reacted either by themselves or with other cycloolefins which can be polymerized under ring opening and/or with hydrocarbon polymers having at least one unbranched double bond in the main chain, in the presence of metathetical catalyst.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 20 OF 27 USPAT2 on STN  
ACCESSION NUMBER: 2005:259858 USPAT2  
TITLE: Objective lens and optical pickup apparatus  
INVENTOR(S): Ohta, Tatsuo, Otsuki, JAPAN  
Nozaki, Takashi, Hino, JAPAN  
PATENT ASSIGNEE(S): Konica Minolta Opto, Inc., Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 7161744	B2	20070109

APPLICATION INFO.: US 2005-97159 20050404 (11)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2004-113166	20040407
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Spector, David N.	
LEGAL REPRESENTATIVE:	Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P.	
NUMBER OF CLAIMS:	15	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 7 Drawing Page(s)	
LINE COUNT:	3987	

AB An objective lens for converging a monochromatic light flux having a specific wavelength in a range of 350 to 450 nm on an optical information recording medium while the objective lens is placed facing the optical information recording medium, the objective lens comprising: a lens body containing a polymer resin having an alicyclic structure; a first film having a refractive index of less than 1.7 for light having a wavelength of 405 nm; a second film having a refractive index of 1.7 or more for the light having the wavelength of 405 nm; and a third film having a refractive index of 1.55 or less for the light having the wavelength of 405 nm, wherein: the first film, the second film and the third film are provided on the lens body; the first film is provided between the lens body and the second film; the second film is provided between the first film and the third film; and a thickness of the first film is in a range of 50 to 15000 nm.

L10 ANSWER 21 OF 27 USPAT2 on STN  
 ACCESSION NUMBER: 2005:125162 USPAT2  
 TITLE: Cyclic olefin addition copolymer and process for producing same, crosslinking composition, crosslinked product and process for producing same, and optically transparent material and application thereof  
 INVENTOR(S): Oshima, Noboru, Tokyo, JAPAN  
 Maruyama, Yooichiroh, Tokyo, JAPAN  
 Kaizu, Michitaka, Tokyo, JAPAN  
 Sawada, Katsutoshi, Tokyo, JAPAN  
 Hayashi, Toshihiro, Tokyo, JAPAN  
 Ohkita, Kenzo, Tokyo, JAPAN  
 PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6992154	B2	20060131
APPLICATION INFO.:	US 2004-969065		20041021 (10)
RELATED APPLN. INFO.:	Division of Ser. No. US 2002-241578, filed on 12 Sep 2002, Pat. No. US 6844403		

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-277847	20010913
	JP 2001-336593	20011101
	JP 2002-15388	20020124
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Harlan, Robert D.	
LEGAL REPRESENTATIVE:	Oblon, Spivak, McClelland, Maier & Neustadt, P.C.	
NUMBER OF CLAIMS:	20	

EXEMPLARY CLAIM:

1

NUMBER OF DRAWINGS: 12 Drawing Figure(s); 12 Drawing Page(s)

LINE COUNT: 2046

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides a cyclic olefin addition copolymer which has a reactive silyl group having a specific structure, excels in optical transparency, heat resistance, and adhesion, and is capable of producing a crosslinked product having improved dimensional stability, solvent resistance, and chemical resistance. The present invention also provides a process for producing the cyclic olefin addition copolymer, a crosslinking composition, a crosslinked product and a process for producing the same, and an optically transparent material (transparent resin film) comprising the cyclic olefin addition copolymer. The optically transparent material excels in optical transparency and heat resistance, exhibits improved dimensional stability, adhesion, solvent resistance, and chemical resistance, and is capable of improving fragility and preventing occurrence of cracks in the film.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 22 OF 27 USPAT2 on STN

ACCESSION NUMBER: 2004:139564 USPAT2

TITLE: Resin film and applications thereof

INVENTOR(S): Kanamori, Tarou, Tokyo, JAPAN

Kawahara, Kouji, Tokyo, JAPAN

Hashiguchi, Yuuichi, Tokyo, JAPAN

Maruyama, Yooichiroh, Tokyo, JAPAN

Oshima, Noboru, Tokyo, JAPAN

PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

NUMBER	KIND	DATE
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PATENT INFORMATION:

US 6790914 B2 20040914

APPLICATION INFO.:

US 2002-305959 20021129 (10)

DOCUMENT TYPE:

Utility

FILE SEGMENT:

GRANTED

PRIMARY EXAMINER:

Wu, David W.

ASSISTANT EXAMINER:

Hu, Henry S.

LEGAL REPRESENTATIVE:

Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

NUMBER OF CLAIMS:

22

EXEMPLARY CLAIM:

1

NUMBER OF DRAWINGS: 0 Drawing Figure(s); 0 Drawing Page(s)

LINE COUNT: 1775

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A film for a display device produced by using a transparent (crosslinked) resin film formed of a composition including a cyclic olefin addition copolymer of the present invention has optical transparency, heat resistance, liquid crystal resistance, dimensional stability, and adhesion and is suitably used as an alternative to a glass substrate of a liquid crystal display device and an EL display device. The transparent (crosslinked) resin film can be used as a polarizing film, surface protective film, retardation film, transparent conductive film, light diffusion film, film for an EL display device, transparent conductive composite material, antireflection film, and the like.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 23 OF 27 USPAT2 on STN

ACCESSION NUMBER: 2004:83417 USPAT2

TITLE: Processes for producing cycloolefin addition polymer  
INVENTOR(S): Ohkita, Kenzo, Tokyo, JAPAN  
Oshima, Noboru, Tokyo, JAPAN  
Imamura, Takashi, Tokyo, JAPAN  
Tsubouchi, Takashi, Tokyo, JAPAN  
PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6911507	B2	20050628
	WO 2002005916		20020801
APPLICATION INFO.:	US 2003-466429		20010123 (10)
	WO 2001-JP200453		20010123
			20030716 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-15318	20010124
	JP 2003-2001227248	20010727
	JP 2003-2001227249	20010727
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Teskin, Fred	
LEGAL REPRESENTATIVE:	Oblon, Spivak, McClelland, Maier & Neustadt, P.C.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	1454	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A cyclic olefin having a specific polar group is polymerized by addition polymerization in a hydrocarbon solvent, using a polymerization catalyst component containing (i) a specific transition metal compound, (ii) a Lewis acid compound and (iii) an alkyl aluminoxane, or the cyclic olefin is polymerized by addition polymerization in the hydrocarbon solvent, using the polymerization catalyst component, by further adding at least one aromatic vinyl compound and at least one cyclic nonconjugated polyene compound, or either one of them as a molecular weight modifier, thereby obtaining a cyclic olefinic addition polymer.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 24 OF 27 USPAT2 on STN  
ACCESSION NUMBER: 2004:11278 USPAT2  
TITLE: Self-healing polymer compositions  
INVENTOR(S): Skipor, Andrew, West Chicago, IL, UNITED STATES  
Scheifer, Steve, Hoffman Estates, IL, UNITED STATES  
Olson, Bill, Lake Villa, IL, UNITED STATES  
PATENT ASSIGNEE(S): Motorola, Inc., Schaumburg, IL, UNITED STATES (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 7108914	B2	20060919
APPLICATION INFO.:	US 2002-195858		20020715 (10)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Lam, Cathy F.		
NUMBER OF CLAIMS:	15		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	12 Drawing Figure(s); 5 Drawing Page(s)		

LINE COUNT: 978

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB A self-healing polymer composition 10 contains a polymer media 12 and a plurality of microcapsules of flowable polymerizable material 16 dispersed in the polymer media 12, where the microcapsules of flowable polymerizable material 16 contain a flowable polymerizable material 15 and have an outer surface 142 upon which at least one polymerization agent 13 is chemically attached. The microcapsules 16 are effective for rupturing with a failure of the polymeric media 12, and the flowable polymerizable material 15 reacts with the polymerization agent 13 when the polymerizable material 15 makes contact with the polymerization agent 13 upon rupture of the microcapsules 14. There is also provided a method of using the self-healing polymeric composition 10 to repair fractures in polymers, as well as articles of manufacture including the self-healing system, and the microencapsulated polymerizable particles 16 themselves.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 25 OF 27 USPAT2 on STN

ACCESSION NUMBER: 2003:174113 USPAT2

TITLE: CYCLIC OLEFIN ADDITION COPOLYMER AND PROCESS FOR PRODUCING SAME, CROSSLINKING COMPOSITION, CROSSLINKED PRODUCT AND PROCESS FOR PRODUCING SAME, AND OPTICALLY TRANSPARENT MATERIAL AND APPLICATION THEREOF

INVENTOR(S):  
Oshima, Noboru, Tokyo, JAPAN  
Maruyama, Yooichiroh, Tokyo, JAPAN  
Kaizu, Michitaka, Tokyo, JAPAN  
Sawada, Katsutoshi, Tokyo, JAPAN  
Hayashi, Toshihiro, Tokyo, JAPAN  
Ohkita, Kenzo, Tokyo, JAPAN

PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6844403	B2	20050118
APPLICATION INFO.:	US 2002-241578		20020912 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-277847	20010913
	JP 2001-336593	20011101
	JP 2002-15388	20020124

DOCUMENT TYPE: Utility  
FILE SEGMENT: GRANTED  
PRIMARY EXAMINER: Harlan, Robert D.  
LEGAL REPRESENTATIVE: Oblon, Spivak, McClelland, Maier & Neustadt, P.C.  
NUMBER OF CLAIMS: 22  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 12 Drawing Figure(s); 12 Drawing Page(s)  
LINE COUNT: 2154

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB The present invention provides a cyclic olefin addition copolymer which has a reactive silyl group having a specific structure, excels in optical transparency, heat resistance, and adhesion, and is capable of producing a crosslinked product having improved dimensional stability, solvent resistance, and chemical resistance. The present invention also provides a process for producing the cyclic olefin addition copolymer, a crosslinking composition, a crosslinked product and a process for producing the same, and an optically transparent material (transparent

resin film) comprising the cyclic olefin addition copolymer. The optically transparent material excels in optical transparency and heat resistance, exhibits improved dimensional stability, adhesion, solvent resistance, and chemical resistance, and is capable of improving fragility and preventing occurrence of cracks in the film.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 26 OF 27 USPAT2 on STN  
ACCESSION NUMBER: 2002:236190 USPAT2  
TITLE: Thermoplastic resin composition and shaped articles thereof  
INVENTOR(S): Zen, Shinichiro, Tokyo, JAPAN  
Shimizu, Akira, Mie-ken, JAPAN  
PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6562908	B2	20030513
APPLICATION INFO.:	US 2002-40351		20020109 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-3745	20010111
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Nutter, Nathan M.	
LEGAL REPRESENTATIVE:	Oblon, Spivak, McClelland, Maier & Neustadt, P.C.	
NUMBER OF CLAIMS:	11	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	913	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB Described are a thermoplastic resin composition containing (A): one or more rubber reinforced thermoplastic resins, (B): one or more acrylic resins and (C): one or more thermoplastic norbornene resins, and further containing (D): one or more styrenic resins other than (A) and (E): coloring agents as needed, and a shaped article obtained by forming the composition. Described thermoplastic resin composition is excellent in heat resistance, strength and processability, and excellent in laser marking properties, so that it is useful for various applications.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 27 OF 27 CAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1979:475528 CAPLUS  
DOCUMENT NUMBER: 91:75528  
ORIGINAL REFERENCE NO.: 91:12225a,12228a  
TITLE: Curable composition containing EPM or EPDM interpolymers  
INVENTOR(S): Tsai, Thomas C. H.  
PATENT ASSIGNEE(S): Copolymer Rubber and Chemical Corp., USA  
SOURCE: U.S., 8 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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 US 4153765 A 19790508 US 1978-890125 19780327  
 PRIORITY APPLN. INFO.: US 1976-681433 A1 19760429  
 AB Liquid modified EPM and EPDM rubbers curable by moisture at room temperature  
 are

prepared by copolymerg. ethylene, propylene, and an optional nonconjugated diene with a Cl3Si-substituted unsatd. hydrocarbon, replacing the Cl by alkoxy when this can no longer poison the polymerization catalysts, and blending the product with an organotin carboxylate. Thus, ethylene, propylene, and 7-isopropylidene-5-(trichlorosilyl)-2-norbornene were copolymerd. in hexane in the presence of a catalyst consisting of Et3Al2Cl3, VOCl3, and Bu perchlorocrotonate and the polymer cement formed was washed with MeOH. The solvent was removed under reduced pressure to give a honey-colored liquid with Brookfield viscosity 15,000 P at 23.5°, containing 5 weight % 7-isopropylidene-5-(trimethoxysilyl)-2-norbornene units. This polymer 100, SiO2 20, TiO2 5, ZnO 5, and dibutyltin dilaurate [77-58-7] 5 parts were compounded to give a smooth paste which became tack-free in ≈6 h and cured in ≈1 wk under atmospheric conditions to an elastomer with tensile strength 200 psi, elongation 135%, and Shore A hardness 32.

=> d l10 6 ibib hit

L10 ANSWER 6 OF 27 USPATFULL on STN  
 ACCESSION NUMBER: 2004:308106 USPATFULL  
 TITLE: Rubber composition and vulcanized rubber  
 INVENTOR(S): Nakano, Sadayuki, Ichihara-shi, JAPAN  
 Sassa, Tatsuo, Ichihara-shi, JAPAN  
 Kawashima, Jun, Ichihara-shi, JAPAN  
 PATENT ASSIGNEE(S): SUMITOMO CHEMICAL COMPANY, LIMITED (non-U.S.  
 corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 20040242782	A1	20041202
APPLICATION INFO.:	US 2004-852154	A1	20040525 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2003-152083	20030529
	JP 2003-152084	20030529
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	SUGHRUE MION, PLLC, 2100 PENNSYLVANIA AVENUE, N.W., SUITE 800, WASHINGTON, DC, 20037	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
LINE COUNT:	693	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AB (A) an ethylene- $\alpha$ -olefin copolymer rubber and/or an ethylene- $\alpha$ -olefin-non-conjugated diene copolymer rubber,  
 AB (B1) an organic compound having a weight average molecular weight of from 1,000 to 1,000,000, and containing a silicon atom in an amount of from 2 to 30% by weight, wherein the total amount of the organic compound is 100% by weight, or (B2) an ethylene- $\alpha$ -olefin-silylnorbornene copolymer rubber, and  
 SUMM [0009] (A) an ethylene- $\alpha$ -olefin copolymer rubber and/or an ethylene- $\alpha$ -olefin-non-conjugated diene

copolymer rubber,

- SUMM [0014] (A) an ethylene- $\alpha$ -olefin copolymer rubber and/or an ethylene- $\alpha$ -olefin-non-conjugated diene copolymer rubber,
- SUMM [0015] (B2) an ethylene- $\alpha$ -olefin-silylnorbornene copolymer rubber, and
- DETD [0019] An  $\alpha$ -olefin in both of the ethylene- $\alpha$ -olefin copolymer rubber (hereinafter, referred to as "copolymer rubber 1") and the ethylene- $\alpha$ -olefin-non-conjugated diene copolymer rubber (hereinafter, referred to as "copolymer rubber 2") of the component (A) means an  $\alpha$ -olefin containing from 3 to 10 carbon atoms. Hereinafter, the copolymer rubber 1 and the copolymer rubber 2 are collectively referred to "copolymer rubber". Examples of the  $\alpha$ -olefin are propylene, 1-butene, 1-pentene, 1-hexene, 4-methyl-1-pentene, 1-octene and 1-decene. Among them, preferred is propylene or 1-butene.
- DETD [0024] An example of the copolymer rubber 1 is ethylene-propylene copolymer rubber, and an example of the copolymer rubber 2 is ethylene-propylene-5-ethylidene-2-norbornene copolymer rubber.
- DETD [0034] An example of the component (B2) is ethylene-propylene-trichlorosilylnorbornene copolymer rubber.
- DETD [0042] Examples of the compound represented by the above-mentioned formula are 5-trichlorosilyl-2-norbornene, 5-dichloromethylsilyl-2-norbornene, 5-chlorodimethylsilyl-2-norbornene, 5-tribromosilyl-2-norbornene, 5-dibromomethylsilyl-2-norbornene, 5-bromodimethylsilyl-2-norbornene, 5-dichloroethylsilyl-2-norbornene, 5-chlorodiethylsilyl-2-norbornene, 5-trimethoxysilyl-2-norbornene and 5-triethoxysilyl-2-norbornene. Among them, preferred is a compound whose silicon atom has a halogen atom-containing substituent group, and particularly preferred is a compound whose silicon atom has a chlorine atom-containing substituent group. An example of said compound is 5-trichlorosilyl-2-norbornene.
- DETD [0076] Oil-extended ethylene-propylene-5-ethylidene-2-norbornene copolymer rubber having Mooney viscosity (ML<sub>1+4</sub>, 121° C.) of 60 and an iodine value of 10, and comprising (i) 100 parts by weight of ethylene-propylene-5-ethylidene-2-norbornene copolymer rubber having an ethylene unit content of 70% by weight and a propylene unit content of 30% by weight, the total of the both units being 100% by weight, and (ii) 40 parts by weight of extender oil.
- DETD [0080] (i) it contains a continuous phase of an ethylene-vinyl acetate copolymer (EVA),
- DETD [0087] Ethylene-propylene-trichlorosilylnorbornene copolymer rubber produced in the below-mentioned Reference Example 1, and having the following characteristics, wherein the total amount of said copolymer rubber is 100% by weight:
- DETD [0115] After 30 minutes from the initiation, 10 ml of methanol containing 0.1 g of 2,6-di-t-butyl-p-cresol (trade name of SUMILIZER BHT, manufactured by Sumitomo Chemical Co., Ltd.) was added to the obtained polymerization reaction mixture to terminate the polymerization. The obtained copolymer rubber solution was concentrated, and the copolymer rubber was recovered by a methanol-precipitation method. The recovered copolymer rubber was vacuum-dried at 80° C. for 12 hours, thereby obtaining 4.92 g of an ethylene-propylene-trichlorosilylnorbornene copolymer rubber.
- CLM What is claimed is:
1. A rubber composition comprising the following components (A), (B1)

and (C): (A) an ethylene- $\alpha$ -olefin copolymer rubber and/or an ethylene- $\alpha$ -olefin-non-conjugated diene copolymer rubber, (B1) an organic compound having a weight average molecular weight of from 1,000 to 1,000,000, and containing a silicon atom in an amount of from 2 to 30% by weight, wherein the total amount of the organic compound is 100% by weight, and (C) a reinforcement.

CLM What is claimed is:

5. A rubber composition comprising the following components (A), (B2) and (C): (A) an ethylene- $\alpha$ -olefin copolymer rubber and/or an ethylene- $\alpha$ -olefin-non-conjugated diene copolymer rubber, (B2) an ethylene- $\alpha$ -olefin-silylnorbornene copolymer rubber, and (C) a reinforcement.

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L10 ANSWER 15 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 2000:125116 USPATFULL  
TITLE: Photodefinable dielectric compositions comprising polycyclic polymers  
INVENTOR(S): Shick, Robert A., Strongsville, OH, United States  
Jayaraman, Saikumar, Twinsburg, OH, United States  
Elce, Edmund, Akron, OH, United States  
Goodall, Brian L., Akron, OH, United States  
PATENT ASSIGNEE(S): The B. F. Goodrich Company, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6121340		20000919
APPLICATION INFO.:	US 1997-964080		19971104 (8)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1996-30410P	19961104 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Berman, Susan W.	
LEGAL REPRESENTATIVE:	Dunlap, Thoburn T.	
NUMBER OF CLAIMS:	33	
EXEMPLARY CLAIM:	1	
LINE COUNT:	3578	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM As disclosed in Japanese Kokai Application No. 7-104474 to Nippon Zeon Co., Ltd. (NZ '474) attention is being directed to the polycycloolefins (e.g. polymers derived from polycyclic monomers containing a norbornene moiety). Because of their high hydrocarbon content, polycycloolefins have low dielectric constants and low affinities for moisture. Presently, there are several routes to polymerize cyclic olefin monomers such as norbornene or other higher polycyclic monomers containing the norbornene functionality. These include: (1) ring-opening metathesis polymerization (ROMP); (2) ROMP followed by hydrogenation; (3) addition copolymerization (Ziegler type copolymers with ethylene); and (4) addition homopolymerization. Each of the foregoing routes produces polymers with specific structures as shown in the diagram below: ##STR1##

- SUMM In another embodiment of the same disclosure, addition copolymers derived from cycloolefins and an  $\alpha$ -olefin such as ethylene catalyzed in the presence of a transition metal/aluminum catalyst system or addition polymers derived from cycloolefins catalyzed in the presence of transition metal/aluminum or palladium catalyst systems are post functionalized with silyl substituents via a grafting reaction. Notwithstanding the inherent deficiencies of the foregoing addition polymer backbones such as (i) the low Tg of the cycloolefin/ethylene copolymers and (ii) the insolubility of palladium catalyzed cycloaddition polymers, a further drawback is the inherent deficiencies of the post functionalization grafting reaction. As with the post functionalization of the polycyclic ROMP polymers, the amount and placement of the functional group on the backbone can not be controlled. The end result is that the silyl group can be located anywhere on the backbone where a graft reaction can occur. NZ '474 specifically teaches that the disclosed cycloaddition polymers are post functionalized with a silyl group via a conventional free radical generating mechanism. Assuming that the cycloaddition polymer was derived from the simplest of the polycyclic monomers (e.g., norbornene), the silyl functionality would have a probability of grafting to all sites on the polymer backbone that have the potential to form a free radical species (Koch, V. R.; Gleicher, G. J., J. Amer. Chem. Soc., 93:7, 1657-1661 (1971)). Accordingly, the silyl functionality can graft to any or all of the numbered sites shown below in the diagram (lower numbers indicate higher probability grafting sites). ##STR2## In spite of the hierarchy of the grafting site probabilities, the grafted product will comprise a mixture of the grafted products containing silyl functionality at one or more of the numbered sites indicated above. A major disadvantage of free radically grafted addition polymers is the propensity of the backbone to undergo cleavage or scission during the graft reaction. Free radicals generated at the repeating unit attachment sites (site 2 in the above diagram) can cause chain scission.
- SUMM Minami '171 purports that the post modification of the disclosed ethylene/polycycloolefin copolymers leads to high Tg polymers (20 to 250° C.). However, the data reported in the Examples appears to suggest otherwise. The maleic anhydride, vinyltriethoxy silane, and glycidyl methacrylate graft copolymers of Examples 33 to 39 on average exhibit a 2° C. increase in Tg over their non-grafted counterparts. When taking experimental error into account, the slight overall increase in the reported Tg values are nil or insignificant at best. Contrary to the disclosure of Minami '171, high Tg polymers are not attained. In fact, the highest Tg reported in any of the Examples is only 160° C. There is no disclosure to suggest that addition polymerized silyl substituted polycyclic monomers provide polymers with superior physical and adhesive properties, especially adhesion to copper and noble metal substrates. The data reported in the examples also indicates that the highest incorporation through grafting of the vinyl triethoxy silane moiety is less than 0.1 mole %.
- SUMM Illustrative examples of monomers of formula I include 5-triethoxysilyl-norbornene, 5-trimethoxysilyl norbornene, 5-methyldimethoxysilyl norbornene, 5-dimethylmethoxy norbornene and 5-dimethylethoxysilyl norbornene.

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L10 ANSWER 23 OF 27 USPAT2 on STN  
 ACCESSION NUMBER: 2004:83417 USPAT2  
 TITLE: Processes for producing cycloolefin addition polymer  
 INVENTOR(S): Ohkita, Kenzo, Tokyo, JAPAN  
 Oshima, Noboru, Tokyo, JAPAN  
 Imamura, Takashi, Tokyo, JAPAN  
 Tsubouchi, Takashi, Tokyo, JAPAN  
 PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6911507	B2	20050628
	WO 2002005916		20020801
APPLICATION INFO.:	US 2003-466429		20010123 (10)
	WO 2001-JP200453		20010123
			20030716 PCT 371 date

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-15318	20010124
	JP 2003-2001227248	20010727
	JP 2003-2001227249	20010727
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Teskin, Fred	
LEGAL REPRESENTATIVE:	Oblon, Spivak, McClelland, Maier & Neustadt, P.C.	
NUMBER OF CLAIMS:	13	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	0 Drawing Figure(s); 0 Drawing Page(s)	
LINE COUNT:	1454	

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

SUMM As plastic materials having high transparency, heat resistance and the like as described above, cyclic olefin polymers have been proposed. As the cyclic olefin polymers, there have hitherto been proposed hydrogenated ring-opening polymers (Japanese Patent Laid-open Publication (Sho) 60-26024, Japanese Patent No. 3050196, Japanese Patent Laid-open Publication (Hei) 1-132625, Japanese Patent Laid-open Publication (Hei) 1-132625, etc.), addition copolymers of cyclic olefins and ethylene [Japanese Patent Laid-open Publication (Sho) 61-292601, Makromol. Chem. Macromol. Symp. Vol. 47, 83 (1991), etc.], addition copolymers of cyclic olefins (Japanese Patent Laid-open Publication (Hei) 4-63807, Japanese Patent Laid-open Publication (Hei) 8-198919, Published Japanese Translation of PCT Application (Hei) 9-508649, Published Japanese Translation of PCT Application (Hei) 11-505880, etc.) and the like.

SUMM Specific examples of the substituted norbornenes having polar group represented by the above-mentioned formula (2) include 5-trimethoxysilyl-2-norbornene,  
 5-chlorodimethoxysilyl-2-norbornene,  
 5-dichloromethoxysilyl-2-norbornene,  
 5-chloromethoxymethylsilyl-2-norbornene,  
 5-methoxymethylhydrosilyl-2-norbornene,  
 5-dimethoxyhydrosilyl-2-norbornene, 5-methoxydimethylsilyl-2-norbornene,  
 5-triethoxysilyl-2-norbornene, 5-chlorodioethoxysilyl-2-norbornene,  
 5-dichloroethoxysilyl-2-norbornene,  
 5-chloroethoxymethylsilyl-2-norbornene,  
 5-diethoxyhydrosilyl-2-norbornene, 5-ethoxydimethylsilyl-2-norbornene,  
 5-ethoxydiethylsilyl-2-norbornene, 5-tripropoxysilyl-2-norbornene,  
 5-triisopropoxysilyl-2-norbornene, 5-triphenoxysilyl-2-norbornene,

5-diphenoxymethylsilyl-2-norbornene, 5-trifluorosilyl-2-norbornene,  
5-trichlorosilyl-2-norbornene, 5-tribromosilyl-2-norbornene,  
5-trimethoxysilylmethyl-2-norbornene, 5-(1-  
trimethoxysilylethyl)-2-norbornene, 5-(2-  
trimethoxysilylethyl)-2-norbornene,  
5-(1-chlorodimethoxysilylethyl)-2-norbornene,  
5-(2-chlorodimethoxysilylethyl)-2-norbornene,  
5-triethoxysilylmethyl-2-norbornene,  
5-(1-triethoxysilylethyl)-2-norbornene,  
5-(2-triethoxysilylethyl)-2-norbornene,  
5-(1-chlorodiethoxysilylethyl)-2-norbornene,  
5-(2-chlorodiethoxysilylethyl)-2-norbornene, 5-(2-  
trimethoxysilylpropyl)-2-norbornene, 5-(3-  
trimethoxysilylpropyl)-2-norbornene,  
5-(2-triethoxysilylpropyl)-2-norbornene, 5-(3-triethoxysilylpropyl)-2-  
norbornene, trimethoxysilylpropyl 5-norbornene  
-2-carboxylate, triethoxysilylpropyl 5-norbornene-2-carboxylate,  
dimethoxymethylsilylpropyl 5-norbornene-2-carboxylate,  
trimethoxysilylpropyl 2-methyl-5-norbornene-2-carboxylate,  
dimethoxymethylsilylpropyl 2-methyl-5-norbornene-2-carboxylate,  
triethoxysilylpropyl 2-methyl-5-norbornene-2-carboxylate,  
2-acetyl-5-norbornene, methyl 5-norbornene-2-carboxylate, ethyl  
5-norbornene-2-carboxylate, t-butyl 5-norbornene-2-carboxylate, methyl  
2-methyl-5-norbornene-2-carboxylate, ethyl  
2-methyl-5-norbornene-2-carboxylate, t-butyl  
2-methyl-5-norbornene-2-carboxylate, trifluoromethyl  
2-methyl-5-norbornene-2-carboxylate, 5-norbornene-2-yl acetate,  
2-methyl-5-norbornene-2-yl acetate, 2-methyl-5-norbornene-2-yl acrylate,  
2-methyl-5-norbornene-2-yl methacrylate, dimethyl  
5-norbornene-2,3-dicarboxylate, diethyl 5-norbornene-2,3-dicarboxylate,  
5-norbornene-2,3-dicarboxylic acid anhydride, methyl  
8-methyl-3-tetracyclo[4.4.0.1.sup.2,5.1.sup.7,10]dodecene-8-carboxylate,  
spiro ring compounds as shown below, and the like. ##STR3##

SUMM Specific examples of the substituted norbornenes having polar group represented by the above-mentioned formula (3) include 5-  
trimethoxysilyl-2-norbornene,  
5-chlorodimethoxysilyl-2-norbornene,  
5-dichloromethoxysilyl-2-norbornene,  
5-chloromethoxymethylsilyl-2-norbornene,  
5-methoxymethylhydrosilyl-2-norbornene,  
5-dimethoxyhydrosilyl-2-norbornene, 5-methoxydimethylsilyl-2-norbornene,  
5-triethoxysilyl-2-norbornene, 5-chlorodiethoxysilyl-2-norbornene,  
5-dichloroethoxysilyl-2-norbornene,  
5-chloroethoxymethylsilyl-2-norbornene,  
5-diethoxyhydrosilyl-2-norbornene, 5-ethoxydimethylsilyl-2-norbornene,  
5-ethoxydiethylsilyl-2-norbornene, 5-tripropoxysilyl-2-norbornene,  
5-trisopropoxysilyl-2-norbornene, 5-triphenoxysilyl-2-norbornene,  
5-diphenoxymethylsilyl-2-norbornene, 5-trifluorosilyl-2-norbornene,  
5-trichlorosilyl-2-norbornene, 5-tribromosilyl-2-norbornene and the  
like.

SUMM For example, by optionally containing a structural unit of the norbornene substituted with 3 to 10 carbon atoms alkyl group, the solubility of the resulting polymer in a solvent and the glass transition can be controlled to improve processability, and the flexibility can be imparted to the resulting formed article. Further, by containing a structural unit of the cyclic olefin having a functional group such as an alkenyl group, an alkylidene group, an ester group or an alkoxy silyl group, crosslinking sites allowing the cyclic olefinic

addition polymer to have a three-dimensional network structure, and functions such as adhesive properties to other materials and good dispersibility can also be imparted. Furthermore, one containing a structural unit of the norbornene having an alkoxy silyl group at an appropriate content can be suitably used in a composite with a metal oxide such as silica, alumina or titania.

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L10 ANSWER 25 OF 27 USPAT2 on STN  
ACCESSION NUMBER: 2003:174113 USPAT2  
TITLE: CYCLIC OLEFIN ADDITION COPOLYMER AND PROCESS FOR PRODUCING SAME, CROSSLINKING COMPOSITION, CROSSLINKED PRODUCT AND PROCESS FOR PRODUCING SAME, AND OPTICALLY TRANSPARENT MATERIAL AND APPLICATION THEREOF  
INVENTOR(S): Oshima, Noboru, Tokyo, JAPAN  
Maruyama, Yooichiroh, Tokyo, JAPAN  
Kaizu, Michitaka, Tokyo, JAPAN  
Sawada, Katsutoshi, Tokyo, JAPAN  
Hayashi, Toshihiro, Tokyo, JAPAN  
Ohkita, Kenzo, Tokyo, JAPAN  
PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6844403	B2	20050118
APPLICATION INFO.:	US 2002-241578		20020912 (10)

	NUMBER	DATE
PRIORITY INFORMATION:	JP 2001-277847	20010913
	JP 2001-336593	20011101
	JP 2002-15388	20020124
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Harlan, Robert D.	
LEGAL REPRESENTATIVE:	Oblon, Spivak, McClelland, Maier & Neustadt, P.C.	
NUMBER OF CLAIMS:	22	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	12 Drawing Figure(s); 12 Drawing Page(s)	
LINE COUNT:	2154	
CAS INDEXING IS AVAILABLE FOR THIS PATENT.		
SUMM	(2) Addition copolymer of ethylene and norbornene compound or tetracyclododecene compound	
SUMM	(4) Addition (co)polymer of norbornene compound containing alkoxy silyl group	

DETD Variation of the retardation of the crosslinked film A-2 obtained in Example 1 at a wavelength of 633 nm was  $\pm 5\%$ . An anchor agent solution consisting of a high-molecular-weight ionic complex ("Toyobine 210K" manufactured by Tosoh Corporation) containing water/alcohol (weight ratio: 50/50) as a solvent component was applied to the crosslinked film A-2 and dried at 90° C. for 5 minutes to form an aqueous anchor coat layer. An adhesive layer consisting of a urethane-based adhesive ("Takelac A-371" manufactured by Takeda Chemical Industries, Ltd.) and a curing agent ("Takenate A-10" manufactured by Takeda Chemical Industries, Ltd.) was formed on the aqueous anchor coat layer. An

ethylene-vinyl alcohol copolymer/dichromatic dye-based polarizing film was layered on the adhesive layer and pressed at a temperature of 80° C. and a pressure of 3 kg/cm.sup.2 to form an integrated film. A transparent conductive layer was formed on the surface of the polarizing film by using a sputtering method utilizing a target consisting of indium oxide/tin oxide (weight ratio: 95:5). A liquid crystal display panel having a layer structure consisting of the transparent electrode/polarizing film/adhesive layer/aqueous anchor coat layer/substrate layer was obtained in this manner. Adhesion between the substrate layer and the polarizing film of the laminate was good. No delamination was observed between the substrate layer and the polarizing film. The laminate was subjected to a durability test at a temperature of 80° C. and a relative humidity of 90%. As a result, the laminate showed no abnormalities after 1000 hours of testing and exhibited good durability.

DETD A film with a thickness of 0.1 mm was prepared by using the technique for forming the crosslinked film A-2 in Example 1. A solution of 10 g of a vinyl chloride-vinyl acetate copolymer containing methyl ethyl ketone/ethylene glycol (weight ratio: 40/0.1) as a solvent component was applied to the film and dried to form a resin film with a thickness of 30 μm. The film was immersed in hot water at 80° C. for 45 minutes. The film was then removed from the hot water and dried to obtain a light diffusion composite sheet with a thickness of 130 μm. The light transmittance of the transparent resin film was 75%. The particle diameter was 2-8 μm (individual bubbles).

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REENTER DISPLAY FORMAT FOR ALL FILES (FILEDEFAULT):ibib hit

L10 ANSWER 26 OF 27 USPAT2 on STN

ACCESSION NUMBER: 2002:236190 USPAT2

TITLE: Thermoplastic resin composition and shaped articles thereof

INVENTOR(S): Zen, Shinichiro, Tokyo, JAPAN

Shimizu, Akira, Mie-ken, JAPAN

PATENT ASSIGNEE(S): JSR Corporation, Tokyo, JAPAN (non-U.S. corporation)

NUMBER	KIND	DATE
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PATENT INFORMATION: US 6562908 B2 20030513

APPLICATION INFO.: US 2002-40351 20020109 (10)

NUMBER	DATE
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PRIORITY INFORMATION: JP 2001-3745 20010111

DOCUMENT TYPE: Utility

FILE SEGMENT: GRANTED

PRIMARY EXAMINER: Nutter, Nathan M.

LEGAL REPRESENTATIVE: Oblon, Spivak, McClelland, Maier & Neustadt, P.C.

NUMBER OF CLAIMS: 11

EXEMPLARY CLAIM: 1

NUMBER OF DRAWINGS: 0 Drawing Figure(s); 0 Drawing Page(s)

LINE COUNT: 913

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

DETD Examples of rubber polymers for obtaining component (A) include ethylene- $\alpha$ -olefin copolymers such as ethylene-propylene random and block copolymers and ethylene-butene random and block copolymers; ethylene-unsaturated carboxylic acid ester copolymers such as ethylene-methacrylate and ethylene-butyl acrylate copolymers; ethylene-fatty acid vinyl copolymers such as ethylene-vinyl acetate copolymers; ethylene-propylene-non-conjugated diene terpolymers such as ethylene-  
-propylene-ethylidene-norbornene and ethylene-propylene-hexadiene copolymers; random and block copolymers of polybutadiene, isoprene and styrene-butadiene, and hydrogenated products of these random and block copolymers; diene rubber such as acrylonitrile-butadiene and butadiene-isoprene copolymers; butylene-isoprene copolymers; and silicone rubber. These can be used not only alone, but also as a combination of two or more of them.

DETD Of these, rubber polymers preferred in terms of their properties are diene rubber, ethylene-propylene rubber and ethylene-  
-propylene-non-conjugated diene terpolymers.

DETD 5-trimethoxysilyl-2-norbornene,  
DETD 5-trimethoxysilylmethyl-2-norbornene,  
DETD 5-(2-trimethoxysilyl)ethyl-2-norbornene,  
DETD 5-(1-trimethoxysilyl)ethyl-2-norbornene,  
DETD 5-(2-trimethoxysilyl)propyl-2-norbornene,  
DETD 5-(1-trimethoxysilyl) propyl-2-norbornene,  
DETD trimethoxysilylpropyl-5-norbornene-2-carboxylate,  
DETD Further, specific monomers may be polymerized by ring-opening polymerization in the presence of unsaturated hydrocarbon polymers having carbon-carbon double bonds on main chains thereof, such as polybutadiene, polyisoprene, styrene-butadiene copolymers, ethylene-non-conjugated diene copolymers and polynorbornene. The hydrogenated products of the ring-opening polymers obtained in this case are useful as raw materials for resins having high impact resistance.

DETD AES resin; Copolymer of acrylonitrile 23%/ethylene-  
-propylene rubber 12%/styrene 65% (melt flow rate=15 g/10 min)

=> FIL STNGUIDE

COST IN U.S. DOLLARS

SINCE FILE ENTRY	TOTAL SESSION
---------------------	------------------

FULL ESTIMATED COST

212.31 226.97

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE ENTRY	TOTAL SESSION
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L10 ANSWER 17 OF 27 USPATFULL on STN  
ACCESSION NUMBER: 1999:85532 USPATFULL  
TITLE: Method for preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts  
INVENTOR(S): Makovetsky, Kiryll Lvovich, Moscow, Russian Federation  
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A.V.Topchiev, Russian Federation (non-U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5929181		19990727
APPLICATION INFO.:	US 1997-871245		19970609 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Zitomer, Fred		
LEGAL REPRESENTATIVE:	Shust, Nestor W.		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	1		
LINE COUNT:	1728		
CAS INDEXING IS AVAILABLE FOR THIS PATENT.			
TI	Method for preparation of copolymers of ethylene/norbornene-type monomers with nickel catalysts		
AB	A method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer is disclosed. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method		

comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR1## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

SUMM Addition copolymers of ethylene and norbornene-type monomers are well known and can be prepared using a variety of catalysts disclosed in the prior art. This general type of copolymers can be prepared using free radical catalysts disclosed in U.S. Pat. No. 3,494,897 (Reding et al.); titanium tetrachloride and diethylaluminum chloride as disclosed in East German Patents 109,224 and 222,317 (VEB Leuna); or a variety of vanadium compounds, usually in combination with organoaluminum compounds, as disclosed in European Patent Application No. 156464 (Kajiura et al.). The copolymers obtained with these catalysts are random copolymers. U.S. Pat. No. 4,948,856 issued to Minchak et al. (B.F.Goodrich) discloses preparing generally alternating copolymers by the use of vanadium catalysts which are soluble in the norbornene-type monomer and a co-catalyst which may be any alkyl aluminum halide or alkylalkoxy aluminum halide. European Patent Application No. 0 504 418 A1 (Matsumoto et al.) discloses copolymerization of said monomers in the presence of catalysts such as transition metal compounds, including nickel compounds, and a compound which forms an ionic complex with the transition metal compound or a catalyst comprising said two compounds and an organoaluminum compound. More recently, metallocene catalysts were used to prepare copolymers of cycloolefins and  $\alpha$ -olefins as disclosed in EP 283,164 (1987) issued to Mitsui Petrochemicals and EP 407,870 (1989), EP 485,893 (1990) and EP 503,422 (1991) issued to Hoechst AG. Most recently PCT published application W096/23010 discloses processes of polymerizing ethylene,  $\alpha$ -olefins and/or selected cyclic olefins which are catalyzed by selected transition metal compounds, including nickel complexes of diimine ligands, and sometimes also a cocatalyst. This disclosure provides, however, that when norbornene or a substituted norbornene is used, no other olefin can be present.

SUMM It is a general object of the invention to provide a novel method of preparing amorphous copolymers of ethylene and at least one norbornene (NB)-type comonomer. These polymers may be random or alternating depending on the choice of catalyst and/or the relative ratio of the monomers used. This method comprises polymerizing said monomers in a diluent or in bulk in the presence of a neutral nickel catalyst which may be represented by the formula ##STR2## wherein Y may be a saturated or unsaturated hydrocarbyl chain, X may be oxygen or sulfur, E may be phosphorus, arsenic, antimony, oxygen or nitrogen, R and R' independently each is hydrogen or a hydrocarbyl group, L is a ligand containing a heteroatom P, N or O or L and R together with L may form part of a chelating structure in which case L is an ethylenic double bond.

SUMM This invention is directed to a new method of preparing substantially amorphous copolymers of ethylene and one or more norbornene (NB)-type comonomers. The resulting copolymers may be alternating or random, depending on the relative proportion of each type of monomer used. This method comprises copolymerizing said monomers in the presence of a catalyst which is a neutral nickel compound bearing a bidentate ligand which chelates the nickel via two hetero-atoms (which may be the same or different) and a hydrocarbyl group (R) or a hydride.

- SUMM Catalysts of formula I where E is phosphorus and X is oxygen have been found to preferably yield essentially alternating copolymers of norbornene and ethylene. Nevertheless at extremely high ratio of either one monomer over the other deviations from this alternating compositions are observed. When substituted norbornenes are employed, higher concentrations of the norbornenes are required to obtain the alternating compositions.
- SUMM The instant method is unique in that it makes it possible to prepare copolymers of ethylene with NB-type monomers containing functional substituents such as esters, ethers or silyl groups as disclosed below in greater detail. The catalysts employed in the prior art in the polymerization of cyclic olefins were deactivated if such monomers contained functional substituents.
- SUMM Illustrative examples of suitable monomers include 2-norbornene, 5-butyl-2-norbornene, 5-methyl-2-norbornene, 5-hexyl-2-norbornene, 5-decyl-2-norbornene, 5-phenyl-2-norbornene, 5-naphthyl-2-norbornene 5-ethylidene-2-norbornene, vinylnorbornene, dicyclopentadiene, dihydrodicyclopentadiene, tetracyclododecene, methyltetracyclododecene, tetracyclododecadiene, dimethyltetracyclododecene, ethyltetracyclododecene, ethylenyl tetracyclododecene, phenyltetracyclododecene, trimers of cyclopentadiene (e.g., symmetrical and asymmetrical trimers), 5-hydroxy-2-norbornene, 5-hydroxymethyl-2-norbornene, 5-methoxy-2-norbornene, 5-t-butoxycarbonyl-2-norbornene, 5-methoxy-carbonyl-2-norbornene, 5-carboxy-2-norbornene, 5-carboxymethyl-2-norbornene, decanoic acid ester of 5-norbornene-2-methanol, octanoic acid ester of 5-norbornene-2-methanol, n-butyric acid ester of 5-norbornene-2-methanol, 5-triethoxysilyl-norbornene, 5-trichlorosilyl-norbornene, 5-trimethylsilyl norbornene, 5-chlorodimethylsilyl norbornene, 5-trimethoxysilyl norbornene, 5-methyldimethoxysilyl norbornene, and 5-dimethylmethoxy norbornene.
- DETD To a clean, dry 500 mL stainless steel reactor 20.0 g of 5-butylnorbornene (133 mmol) in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.0346 g, 0.067 mmol) in toluene (5 mL). The reactor was then pressurized to 300 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 80° C.) overnight. Yield 10.5 g. M.sub.w =65,520 and M.sub.n =29,520. NMR spectroscopy confirmed the product to be a copolymer of ethylene and butylnorbornene.
- DETD To a clean, dry 500 mL stainless steel reactor 5-triethoxysilyl-norbornene (50 mL, 191 mmol) in 100 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature, and was saturated with ethylene. To the reactor was added catalyst C (0.11 g, 0.212 mmol) in toluene (7 mL). The reactor was then pressurized to 385 psig with ethylene. The reaction was allowed to proceed 2 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was poured into an excess of MeOH to precipitate the polymer which was subsequently filtered and dried in a vacuum oven (at 25° C.) overnight. Yield 12.3 g. NMR spectroscopy confirmed the product to be a copolymer of ethylene and triethoxysilylnorbornene.

- DETD To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) was then added to the reactor, followed by hexafluoroacetylacetone (0.14 mL, 1.0 mmol). The reactor was then pressurized to 250 psig with ethylene. The reaction was allowed to proceed 1 h at which time the ethylene pressure was vented, the reactor was lowered and the solution was added to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 6.5 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene and the GPC data revealed the Mw to be 15,200 and the Mn 9,500. The glass transition temperature was determined to be 210° C. by DSC.
- DETD To a clean, dry 500 mL stainless steel reactor 40.0 g (425 mmol) of norbornene in 150 mL of dry, deoxygenated toluene was added under nitrogen. The reactor temperature was allowed to remain at ambient temperature and the stirred solution was saturated with ethylene. Bis(cyclooctadiene)nickel(0) (0.244 g, 0.88 mmol) in toluene (4 mL) and hexafluoroacetylacetone (0.14 mL, 1.0 mmol) were premixed at ambient temperature for 10 minutes and then added to the reactor. The reactor was then pressurized to 400 psig with ethylene. The reaction was allowed to proceed 1 hour at which time the ethylene pressure was vented, the reactor was lowered and the solution was added to an excess of MeOH. The copolymer product precipitated from solution and was filtered and washed with excess methanol. After drying to constant weight (overnight in a vacuum oven at 80° C.) the yield of copolymer amounted to 2.14 grams. Proton NMR confirmed the product to be a copolymer of ethylene and norbornene (77 mole percent norbornene and 23 mole percent ethylene) and the GPC data revealed the Mw to be 15,700 and the Mn 6,500. The glass transition temperature was determined to be 192° C. by DSC.
- DETD In a dry 50 mL flask 0.2569 g. (0.935 mmol) of bis(cyclooctadiene)nickel and 9 mL of dry, deoxygenated toluene were introduced under argon and 0.160 g. (0.905 mmol) of N-isobutylsalicylaldimine in 9 mL of toluene was gradually added from dropping funnel. Red-brown solution was formed. After 6 h an abundant pale brown precipitated Toluene was distilled off and a part of precipitate was dissolved in 43 mL of hexane. Greenish solution obtained contained about 0.01 mmol Ni/mL. 8 mL of this solution and 2 g. (21.3 mmol) of norbornene [NB/Ni=266] in 2 mL of hexane were introduced in a reactor and the latter was pressurized to 3.7 atm. (53 psig) with ethylene. Then the reactor was placed in a thermostat at 80° C. for 4 h. After this was cooled, the ethylene pressure was vented and the solution was poured into excess of methanol to precipitate the polymer. The latter was filtered and dried in vacuum overnight. The yield of the copolymer was 0.16 g. and proton NMR revealed that the copolymer contained 56 mole percent of norbornene and 44 mole percent of ethylene units. DSC revealed the copolymer to exhibit two glass transition points at 135 and 183° C.
- CLM What is claimed is:
1. A method of preparing a substantially amorphous copolymer from ethylene and at least one norbornene-type monomer having the structure ##STR24## wherein R.<sup>1</sup> to R.<sup>4</sup> independently represents hydrogen, linear or branched (C.<sub>1</sub>-C.<sub>10</sub>) alkyl, aromatic or saturated or unsaturated cyclic groups; a functional substituent selected from the group consisting of --(CH<sub>2</sub>).sub.n--C(O)OR, --(CH<sub>2</sub>).sub.n--OR, --(CH<sub>2</sub>).sub.n--OC(O)R,

--(CH<sub>2</sub>).sub.n --C(O)R and --(CH<sub>2</sub>).sub.n --OC(O)OR,  
--(CH<sub>2</sub>).sub.n C(R).sub.2 CH(R)(C(O)OR), --(CH<sub>2</sub>).sub.n  
C(R).sub.2 CH(C(O)OR).sub.2, wherein R represents hydrogen, or linear  
and branched (C<sub>1</sub> to C<sub>10</sub>) alkyl; or a silyl substituent  
represented as follows: ##STR25## wherein R<sup>5</sup> independently  
represents hydrogen, methyl, or ethyl, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup>  
independently represent halogen selected from bromine, chlorine,  
fluorine, and iodine, linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkyl,  
linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkoxy, linear or branched  
(C<sub>1</sub> to C<sub>20</sub>) alkyl carbonyloxy, linear or branched (C<sub>1</sub> to  
C<sub>20</sub>) alkyl peroxy, substituted or unsubstituted (C<sub>1</sub> to  
C<sub>20</sub>) aryloxy; any of R<sup>1</sup> and R<sup>2</sup> or R<sup>3</sup> and R<sup>4</sup>  
when taken together can form a (C<sub>1</sub> to C<sub>10</sub>) alkylidene group;  
m is an integer from 0 to 5; n is an integer from 0 to 10; R<sup>1</sup> and  
R<sup>4</sup>, taken together with the two ring carbon atoms to which they are  
attached, represent a saturated cyclic group of 4 to 8 carbon atoms,  
wherein said cyclic group can be substituted by at least one of R<sup>2</sup>  
and R<sup>3</sup>; said method comprising polymerizing said monomers in the  
presence of a neutral nickel catalyst represented by the formula  
##STR26## wherein Y is a saturated or unsaturated hydrocarbyl chain  
containing 1 to 3 carbon atoms where two adjoining carbon atoms may form  
part of a cyclic structure X is O or S, E is P, As, Sb, N or O, R and R'  
independently is H or C<sub>1-20</sub> hydrocarbyl, n is 0, 1 or 2, and L is a  
ligand bearing the heteroatom P, N or O or alternatively R and L  
together form part of a chelating structure.

CLM

What is claimed is:

14. A method of preparing a substantially amorphous copolymer  
from ethylene and at least one norbornene-type monomer having  
the structure ##STR38## wherein R<sup>1</sup> to R<sup>4</sup> independently is a  
functional substituent selected from the group consisting of  
--(CH<sub>2</sub>).sub.n --C(O)R, --(CH<sub>2</sub>).sub.n --OR, --(CH<sub>2</sub>).sub.n  
--OC(O)R, --(CH<sub>2</sub>).sub.n --C(O)R and --(CH<sub>2</sub>).sub.n --OC(O)OR,  
--(CH<sub>2</sub>).sub.n C(R).sub.2 CH(R)(C(O)OR), --(CH<sub>2</sub>).sub.n  
C(R).sub.2 CH(C(O)OR).sub.2, wherein R represents hydrogen, or linear  
and branched (C<sub>1</sub> to C<sub>10</sub>) alkyl; or a silyl substituent  
represented as follows: ##STR39## wherein R<sup>5</sup> independently  
represents hydrogen, methyl, or ethyl, R<sup>6</sup>, R<sup>7</sup>, and R<sup>8</sup>  
independently represent halogen selected from bromine, chlorine,  
fluorine, and iodine, linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkyl,  
linear or branched (C<sub>1</sub> to C<sub>20</sub>) alkoxy, linear or branched  
(C<sub>1</sub> to C<sub>20</sub>) alkyl carbonyloxy, linear or branched (C<sub>1</sub> to  
C<sub>20</sub>) alkyl peroxy, substituted or unsubstituted (C<sub>1</sub> to  
C<sub>20</sub>) aryloxy; any of R<sup>1</sup> and R<sup>2</sup> or R<sup>3</sup> and R<sup>4</sup>  
when taken together can form a (C<sub>1</sub> to C<sub>10</sub>) alkylidene group;  
m is an integer from 0 to 5; n is an integer from 0 to 10; R<sup>1</sup> and  
R<sup>4</sup>, taken together with the two ring carbon atoms to which they are  
attached, represent a saturated cyclic group of 4 to 8 carbon atoms,  
wherein said cyclic group can be substituted by at least one of R<sup>2</sup>  
and R<sup>3</sup>; said method comprising polymerizing said monomers in the  
presence of a neutral nickel catalyst represented by the formula  
##STR40## wherein Y is a saturated or unsaturated hydrocarbyl chain  
containing 1 to 3 carbon atoms where two adjoining carbon atoms may form  
part of a cyclic structure X is O or S, E is P, As, Sb, N or O, R and R'  
independently is H or C<sub>1-20</sub> hydrocarbyl, n is 0, 1 or 2, and L is a  
ligand bearing the heteroatom P, N or O or alternatively R and L  
together form part of a chelating structure in which case L can be a  
C.dbd.C double bond.

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FILE 'INPADOCDB, CAPLUS' ENTERED AT 16:10:26 ON 12 DEC 2008  
L1 1 S WO 1999/014635/PN  
L2 2 S EP 1021750/PN

FILE 'STNGUIDE' ENTERED AT 16:12:44 ON 12 DEC 2008

FILE 'USPATFULL, USPATOLD, USPAT2, CAPLUS, JAPIO' ENTERED AT 16:16:33 ON  
12 DEC 2008

L3 0 S TRIMETHYLSILYL!!!!!!TETRACYCLO!!!!CARBOXYLATE  
L4 0 S TRIMETHYLSILYL!!!!!!TETRACYCLO!!!! CARBOXYLATE  
L5 66 S TRIMETHYLSILYL(1W)NORBORNEN?  
L6 329756 S (ETHYLENE OR ETHENE) (4A) (COPOLYMER# OR TERPOLYMER#)  
L7 9 S L5 AND L6  
L8 3 S (SILYL?(3A)CARBOXYLATE#) (4A) (NORBORNEN? OR BICYCLO[2.2.1]HEPT  
L9 92 S (TRIMETHOXYSILYL? OR TRIALKOXYSILYL? OR ALKOXYSILYL?) (2A) NORB  
L10 27 S L6 AND L9

FILE 'STNGUIDE' ENTERED AT 16:36:33 ON 12 DEC 2008

FILE 'USPATFULL, USPATOLD, USPAT2, CAPLUS, JAPIO' ENTERED AT 16:40:34 ON  
12 DEC 2008

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COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	11.35	238.74
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE ENTRY	TOTAL SESSION
CA SUBSCRIBER PRICE	0.00	-2.40

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